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Technical Service

From the Dyestuff Manufacturer's Viewpoint*

By P. H. STOTT
E. I. du Pont de Nemours & Co., Inc.

GATHERED here today in this Annual Reunion of Alumni of the Lowell Textile Institute are men who, since graduation, have applied their training in the fundamentals of science to many varied branches of the textile industry. I say "fundamentals" advisedly, because what young man on the day of graduation does not cherish idealistic and even revolutionary thoughts as to what he is going to accomplish when he gets his first job? It is a good thing that he feels that way. If his enthusiasm had been dampened by the exigencies of such "minor" matters as costs, production, quality and other, to him, unheard-of obstacles that stand in the way of his good intentions, one of the most valuable contributions to his education would be lost. As the theories he has learned are gradually resolved by experience into practices, realization gradually comes that other people have been there before him. As the panorama unfolds further and the more or less complete picture of the many diversifications of his profession is presented, his enthusiasm will cause him to carry on—or else he drops out entirely and becomes a bond or insurance salesman. The fact that you gentlemen still attend such a gathering as this is indicative of the retention of your interest in your chosen profession. Your experiences have taught you that more exists in it than you ever thought possible. The worries and responsibilities of keeping the wheels turning are there, and always will be, but is there not enough of the unusual and unexpected to re-kindle the fires of enthusiasm with the joy of unusual accomplishment? The solution of unusual problems is the salt with which professional practice is savored and were it not for these, our daily tasks would be monotonous indeed. This brings me to the main theme of my talk. Some of you may not realize the extent of the technical machinery which has to be set up by the supplier of your colors to insure standard deliveries; to furnish color cards and information on the fastness and properties of colors; to match shades, test samples and perform other duties incidental to the privilege of competing for business.

*This paper was presented at the Technical Hour, 34th Annual Reunion of the Lowell Textile Institute. Other papers read at this time were as follows: "The Research Program of the A. T. T. C. & C.," by Louis A. Olney; "The Use of the Verigraph to Determine the Moisture Content of Textiles," by Albert R. Dudley; "Finishing Machinery," by Ralph L. Marble; "Carding Machinery," by Harold T. Godfrey; "Cotton Production on the South Plains of Texas," by Carl D. Brandt (read by Franz E. Baker) and "The Need of Scientific Instruments in Textile Manufacturing," by Benjamin J. Zalkind and a paper by Alfred B. Anderson.

The performance of these duties constitute the routine production part of a laboratory's activity. They are done with two main objects in view, accuracy and speed, and to accomplish these results a very comprehensive organization must be established and maintained.

We are so accustomed to seeing colored objects of all kinds that we are apt to become sophisticated on the subject, and yet color is the keynote of sales appeal. A certain soap offered to us in a characteristically colored wrapper would lose at least half its appeal if the paper wrapper were white, because we are accustomed to the other color. A foodstuff sold in a can or box with a distinctively printed label would probably be regarded as an imitation if the label were changed in color without an

explanation. Colored candles for our tables to blend with colored linen and glassware are considered by most hostesses to be indispensable. Toilet articles tinted in delicate pastel shades to blend with draperies and curtains of bedrooms are considered to be advanced in good taste. Ladies like colored shoes to match their dresses; children love colored rubber toys and to round out the picture, who prefers an unpainted house to a white one artistically trimmed in green?

In the above short paragraph we have mentioned in addition to textiles, soap, paper (dyed and printed) wax, condensed resins, leather, rubber and paint. The furnishing of color for these articles is just as much the problem of the dyestuff manufacturer as is the supplying of dyestuffs for the textile industry, and it means that any technical service laboratory must be equipped to answer questions, make experiments and furnish expert demonstrator service to the consumer as an aid to merchandising products for these purposes. An examination of the exhibits which I have brought with me will serve to illustrate some of the work done on various materials previously referred to.

Specialists

To accomplish this type of service it is obvious that the staff of the technical organization must contain men who are specialists in the various branches of color consuming industries, and experience has shown that departmental organization with a speicalist in charge of each division has given the most satisfactory results. Such an organization will have probably about ten divisions, some of which may be subdivided according to their size. The main divisions can be classified as

Sub-divisions

Textiles—
- Cotton
- Wool & union materials
- Silk, rayon and acetate silks
- Printing

Standardization
Paper
Leather—Tanning
Lakes, Inks, Paint, etc.
Rubber—Chemistry of Accelerators
Chemical and Analytical
Research and Development
Advertising, Color Cards, etc.
Raw Materials

As previously stated each of these divisions must have as its head a man who has been trained not only to understand and perform the routine demand, but who must have actual knowledge of the application of his laboratory routine in practice. Any normally intelligent boy can be trained to dye skeins or cloth in a pot but his perspective is much too narrow to permit him to handle quantities of material of definite value on a piece of apparatus with which he is not familiar. Consequently a technical laboratory must equip itself with machinery of sufficient diversification to duplicate mill dyeing conditions and no laboratory is properly equipped unless it has jigs, padders, pressure and printing machines and the like. What is true for textiles is equally true for other branches. In the paper division we find small beaters and calender rolls in constant use and even model paper making machines. The rubber division must be equipped with vulcanizers, rubber mills, etc., and the leather division with drums to imitate the action of those used in practice. A color to be used in paint or printing ink must be tested under conditions which will be met in ultimate consumption so paint mills and lithographing machines are necessary as standard equipment.

Laboratory Technique

Of course, the mechanical part of the equipment of a laboratory is easiest to provide. An intimate knowledge of practical methods and an ability to adapt laboratory methods to them, perhaps is the most difficult for a service laboratory to provide for itself. Practical men are rarely laboratory minded and purely laboratory experience can readily be understood to be limited in value. In many cases therefore the service laboratory has to depend on the willingness of mills and manufacturing establishments to grant access to these laboratory trained men so they can gain the experience necessary to correctly interpret mill methods in terms of laboratory manipulation.

Suppose we take an example or two of some of the laboratory's technique in arriving at a desired result. We will assume that the sales division decides to manufacture a color already supplied to the market by a competitor. After the usual investigation of the possibility of sales volume, patent situation, availability of raw materials, investments required and so on, the problem is turned over to the research and manufacturing departments and preliminary samples are produced. These come to the technical laboratory for testing. This testing does not mean just shade and strength but includes every possible test that can be thought of, necessary to find some inherent weakness against the competing product. It is tested on all manner of textiles by all methods likely to be encountered in its application. A great variety of fastness tests are made; solubility is determined; it is dyed on paper, leather, tested for use in pigments and for any special purposes for which it is known to be particularly suitable. Many rejections are made before the final sample is approved and then the color goes to a small scale production plant, where the process is refined and finally it gets into regular production. As the batches are produced one by one careful selection is necessary before blending to assure duplication of standard shade and then after blending and many more tests on a variety of materials the lot which by this time may total 10,000 lbs. is packed into barrels, and as a final precaution against uneven mixing, each barrel is again tested. In this process every division in the laboratory has played its part and now the color card division prepares a printed circular and sample dyeings for distribution to the trade. The circular contains

brief statements governing the more important properties of the color based on information accumulated by the laboratory. From this point on the manufacturing and standardizing departments control the color in subsequent production to rigorously maintain quality and uniformity.

Each color, which is produced goes through this process as described so you can readily understand the amount of work involved in creating a line containing several hundred dyestuffs to say nothing of the examination of competing products.

As a second example let us assume that the chemical research department has developed a dyestuff of entirely new constitution. This goes through still more investigation to determine its potential value. In addition to all the tests involved in our previous illustration it must be examined for possibility of use for special purposes so that nothing is overlooked in which the product might find a use. Much too frequently it is found that colors already on the market will do all that the new color will do and probably at a lower cost and so the new product becomes of no commercial interest, but goes into the archives of the company as an interesting academic accomplishment and, of course, carries the investment of the cost of its development with it.

In the time alloted to me it is not possible to describe all the functions of a technical laboratory and one more example must suffice. Suppose we consider the preparation of a color card illustrating a line of colors suitable for dyeing wool. With the conception of the idea decisions must be made to cover the material on which to show the shades; the selection of colors; the strength and number of dyeings and the most suitable arrangement of them. A choice of the most suitable paper, binding and style of type must be made. The descriptive text must be written; fastness properties of the colors tabulated and carefully checked, and methods of application suggested.

The preparation of the dyeings is no small task in itself and the winding of them into bows or on to cardboard strips calls for suitable mechanical equipment and careful supervision. Finally the proofs are assembled and corrected, the pages printed and samples inserted and with the binding the finished product is completed.

The foregoing descriptions give you a very sketchy outline of the functions of a technical service laboratory. Statistics are usually interesting, if for no other reason than that they can be made to sound tremendously impressive. Just how many times the yardage of yarn used for testing could be wrapped around the earth, I don't know, but I do know that about 40,000 skeins and 5,000 pieces of cloth represent a normal usage of material per month. As each one of these skeins and pieces represents a dyeing we find that the preparation of upwards of half a million dyeings per year is an established fact. The standardization of from 2,000 to 2,500 lots for shipment; the testing of perhaps 5,000 dyestuff samples and matching of 2,500 dyed shades to say nothing of dyeings necessary for development work account for this consumption of material, and with it goes a corresponding consumption of chemicals, power, steam and should one add glassware.

Unusual Problems

As I have said, this is just part of the routine duties of the organization and is performed with, let me repeat, the two major objects of accuracy and speed in view. They represent the production end of a laboratory. The unusual problems to which I referred in the early part of my talk as furnishing an impetus to maintenance of interest are naturally much less in evidence. It would be interesting to mention a few to give you an idea of the diversification of requests made.

A few threads of a tapestry reputed to have been made in the 16th century are submitted. An identification of the dyestuffs used is requested to determine at least their contemporaneous nature.

A biologist wishes to study the effect of serums on the actions of chickens. In order not to excite the fowl to abnormal behavior by too close proximity he wishes to find colors to dye their feathers without affecting either "mental" or physical processes, so he can make his observations from a distance.

Since Cellophane has attained such tremendous popularity for all kinds of purposes other than wrapping for protection, the dyeing of it has presented a very interesting problem. Being essentially rayon, direct colors are most generally used, but to fit in with the actual manufacture of the product they must have unusually good affinity as time is a most important feature. The mechanical part of the process required some careful thought and experimentation before a satisfactory solution of the problem was reached.

The selection of dyestuffs for coloring paper to be used for bank checks has presented a very interesting problem. The colors must be destroyed by the methods used by forgers to eradicate ink, and must not be capable of restoration by any means. Incidentally this problem is directly related to the one of printing on the check paper a colorless chemical compound which is developed to a permanent color by the chemicals used in destroying the ink. This combination makes safety doubly sure.

Among other problems presented are the use of dyestuffs in making monochromatic photographic plates; to indicate differences in degree of mercerization; for coloring gasoline and dried shrubs for Christmas and other decorations. Many other problems come to the attention of a technical service laboratory and with the advancement of scientific accomplishment in industry, resulting

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ANNUAL MEETING

A. A. T. C. & C.

Chicago **Sept. 8 and 9**

Rayon Dyeing and Finishing—9

(Continued from page 401, June 19th issue)

By **B. L. HATHORNE**
Consulting Textile Chemist

CHAPTER III—DELUSTERED RAYON*

By HENRY GREEN
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SHORTLY after rayon fabrics became strong enough and uniform enough to create a popular demand, it became evident that the extreme luster of these fabrics, hithertofore considered an advantage, was objectionable in many fabric constructions.

It was soon found that subdued luster fabrics could be produced in three different ways:—

(1) By utilizing multiple filament yarns.
(2) By greatly increasing the twist of the yarn.
(3) By the application of various surface coatings to filaments, yarns and fabrics.

Experiments proved that whereas the softness and pleasing appearance of multiple filament yarns gives them a very definite place among the textile fibers, the manufacturing difficulties inevitably connected with the manufacture of fabric from multiple filament yarns make it impracticable to attempt to use them for their delustering value alone. Multiple filament yarns must be used in constructions that allow every advantage inherent in them to enhance the value of the fabric.

The second step in the production of delustered rayon fabric from the yarns available before delustered yarns came on the market was the utilization of high twist yarns. High twist yarns are still used to produce certain delustered fabrics, such as voiles, georgettes, and chiffons, and will continue to be used as long as such fabrics are made.

Many dyers, working independently, soon devised various related methods of producing delustered fabrics by means of the precipitation of barium sulfate upon the fabric. Two baths were used, the first containing barium chloride, the second sodium sulfate. It should be noted that this general method was used by many unscrupulous firms in the production of the so-called "bootleg" delustered yarn which appeared on the market shortly after the true delustered yarns were offered for sale. Fabric made from yarn delustered by this method has a very pleasing appearance but is unfortunately rendered appreciably harsher due to the presence of metallic salts. Further, the delustered effect produced by this method will not withstand a severe washing process.

A few dyers were successful in producing a delustered fabric by precipitating metallic soap, rather than a metallic salt, on the fiber. For this purpose, barium and aluminum soaps were used in most cases. Whereas the production of insoluble metallic soaps on fabrics is relatively simple in theory, the process has proved to be anything but easy in practice. Soap spots, streaks, etc., are readily formed unless extreme care is used.

The proces of delustering yarn by metallic soap consists of two steps:

(1) The fabric is impregnated with a soluble soap.
(2) The fabric is then treated in a bath containing a soluble metallic salt, the metallic soap of which is white, opaque and insoluble in water.

Fabrics delustered by a metallic soap have a very pleasing, leathery hand and are superior in every way to fabrics delustered with simple metallic salts. Unfortunately, however, metallic soaps cause fabrics to be waterproofed, which is often an undesirable feature. The metallic soap treatment is somewhat more permanent than the metallic salt treatment, although both of these treatments leave much to be desired.

Many so-called semi-delustered effects have been produced by the use of fats and waxes applied to the surface of fabrics. As these materials produce a softening effect and a pleasing hand, this practice cannot be condemned nor considered unethical. Only a limited degree of delustering can be obtained in this manner, however.

Fabrics made from cellulose acetate yarns can be given delustering treatments in piece form. Many thousands of yards of cellulose acetate fabric delustered in the piece, have given the consumer satisfaction. However, the difficulty of producing uniform results by this method is so great that utilization of the process has declined.

Cellulose acetate rayon fabrics are delustered in the

*This chapter, written by Mr. Green, will be a part of the book on Rayon Dyeing and Finishing that is to be published by Mr. Hathorne at the conclusion of this series.

piece by treating above 180 degrees F. in a solution, the pH of which is over nine. In practice, the most usual method of producing delustered acetate fabrics is to treat the fabric from ten minutes to one hour at or above 200 degrees F. in a bath containing one-half to three per cent of neutral soap.

The growing demand for low luster rayon products caused rayon chemists and physicists to consider ways and means whereby the same could be economically produced. At first glance, it was evident that from the producer's viewpoint there were only three possible ways of producing delustered rayon.

(1) Roughen the surface of the filament.

(2) Cover the surface of the filament with small, solid particles.

(3) Impregnate the filaments with light dispersing particles.

Although it is possible to roughen the surface of rayon filaments by means of severe chemical treatments and thus produce a permanently delustered rayon yarn, it is obvious that such a treatment must detract materially from the strength of the fiber. Another serious drawback to this possible means of delustering rayon is the fact that a loss of weight would of necessity be involved. A third deterrent is the very apparent difficulty of producing uniform lots from batch to batch.

The only means of producing permanently delustered rayon that is economically sound and easily controlled is the impregnation of the spinning solution with finely-dispersed, light-diffusing substances.

Three types of substances have been used for this purpose to date:

(1) Air.
(2) Oil Globules.
(3) Pigment Particles.

The first delustered rayon to achieve any degree of commercial success was produced by causing small air holes or pockets to be formed inside the individual filament. This type of delustered yarn did not achieve great popularity due to the low tensile strength of the product.

The second delustered rayon to achieve commercial success was oil-delustered rayon. Oil delustered rayon possessed more strength than the original air-delustered yarn and achieved an immediate popularity. Unfortunately, however, only a limited degree of delustering can be obtained by the use of oil particles without encountering certain manufacturing difficulties.

The third method of producing permanently delustered rayon is the dispersion of small pigment particles throughout the individual filaments. The pigment method has a decided advantage over the other methods, in that only a small quantity of material is required to produce a tremendous delustered effect. This is true because the covering power or "hiding power" of pigment particles is tremendously greater than the hiding power of oil globules. The newest method of delustering has achieved much popularity and will undoubtedly become still more important in the future.

Physical Aspects of Delustered Rayon

When a beam of incident light strikes a delustered fiber, a number of things happen. Part of the beam is reflected specularly from the surface of the fiber, so that the angle of reflection is equal to the angle of incidence; part strikes the reflecting surfaces of the delustering particles and is reflected diffusely, i.e., the angle of reflection *with respect to the surface of the fiber* is not equal to the angle of incidence; part is absorbed by the fiber and its contents and not returned; and part is transmitted through the fiber.

Before proceeding with the details of delustering it will be advantageous to review briefly the subject of gloss or luster. Physicists have recognized for a number of years that gloss is both an objective and a subjective phenomenon. Pfund[1], Jones[2], Nutting[3], and Ingersoll[4], have all contributed valuable papers on this subject.

Objective gloss pertains only to the characteristics of the surface. Subjective gloss is the sense impression received upon viewing the yarn or fabric and is governed by the diffuse as well as by the specular reflecting power of the material.

Pfund summarizes his work as follows: "It is proposed to measure the specular reflection from various materials and to determine objective gloss which defines surface characteristics only. Samples are mounted on a circular cylinder which is spun rapidly. Large angles of incidence are employed. The brightness of the image of a source reflected specularly from the cylindrical sample is photometered by means of an optical pyrometer. Actual results show that gloss so measured is independent of the brightness of the background (diffuse reflection.)"

Pfund defines objective gloss as "the ratio of the intensity of light reflected specularly from the material in question, at a stated angle of incidence, to the intensity of light reflected specularly from a perfectly polished surface of the same material, at the same angle of incidence."

According to Pfund, industries such as the paint, varnish, and lacquer industries are concerned primarily with the surface characteristic of their products and therefore they are more interested in the measurement of objective rather than subjective gloss.

Jones, on the other hand, believes that subjective gloss is the more important of the two phenomena. This investigator has studied the reflecting powers of photographic printing-out papers and has recorded measurements which he feels run substantially parallel with actual subjective gloss.

On carrying out a measurement, Jones fixes the incident beam at 45 degrees in all cases. He then measures the intensity of the reflected light in two places; first at 90 degrees or normal to the reflecting surface, and then

along the path of the specularly reflected beam, i.e., at 45 degrees to the normal but opposite the incident beam. The first of these measurements gives the intensity of the diffuse reflection (which is equal in all directions throughout 180 degrees). This is subtracted from the second measurement, the result being the intensity of specular reflection. To obtain a value for the gloss, the intensity of specular reflection is divided by the intensity of the diffuse reflection.

According to Jones, "Gloss must be a function of the brightness contract existing between the more or less clearly defined specular images of light sources having relatively small angular dimensions and the contiguous portions of the surface which owe their brightness to diffusely reflected light." He states further, "that the brightness contrast may be taken as an adequate measure of the physical stimulus producing the sensation of glossiness," but concludes that, "the correlation of the subjective sensation with the physical stimulus remains to be accomplished."

In other words, there is at present no entirely satisfactory method for measuring subjective gloss. The writer is of the opinion that the rayon manufacturer, if at all interested in the measurement of luster, should be concerned with the subjective rather than with the objective phenomenon.

All delustered yarns and fabrics today can be divided into two classes: those that are externally delustered and those that are internally delustered. In both cases there are certain fundamental principles involved. In external delustering, the agent used must not be put on the fiber as a uniform layer or coating like lacquer. It must exist there in the form of discrete particles protruding from the surface of the fiber. These particles diffuse the light and reduce the amount of specular reflection. It is not very important what their refractive index happens to be, as their principal reflecting surfaces are in contact with the air and not with the rayon. The particles must be extremely small so that they can fit into the striations existing in the surface of the fiber. This prevents them from being washed off easily, and also produces a better hand. Failure to recognize these elementary facts in regard to the importance of particle size completely frustrated the early attempts at external delustering. The principal pigments that are now used for this purpose are barium sulfate and titanium dioxide.

Refractive index and particle size must be given even more consideration when we turn to the subject of internal delustering. Refractive index is the ratio of the velocity of light in vacuum to the velocity of light in the material (rayon, oil globules, pigment particles, etc.). If the refractive index of the particles or globules exactly matched that of the rayon, then the system would become transparent, i.e., optically homogeneous; the particles could no longer be seen under the microscope, and consequently the rayon would appear lustrous. In such a case there would be no diffusely reflected light because the reflecting surfaces of the particles for all practical purposes have disappeared.

If we now introduce into the fiber particles that differ substantially from the rayon in refractive index, then the system becomes optically heterogeneous and light will no longer necessarily pass through the system in straight lines. Refraction and diffraction now take place at the particle boundary causing a contour band or edge to appear. The greater the difference in the refractive indices, the wider and darker will the particle edges seem to be. Under this condition a particle that is small enough will appear to be all edge or contour band. Hence, if the particles are sufficiently small and enough of them are introduced so that they produce continuous overlapping of the edges, the fiber will appear opaque by transmitted light even though each particle in itself is actually transparent. By reflected light the fiber will now be white (if colorless particles were used) and delustered.

Given a fixed difference between the refractive indices of the delusterant and the rayon then it becomes obvious that the amount of diffusely reflected light will depend on the reflecting area introduced by the particles of the delusterant. This area in turn depends on both the specific surface of the delusterant and on the percentage of delusterant incorporated.

The specific surface of a pigment is the total area of its particle surfaces in square meters per gram of material; it is inversely proportional to the first power of the average particle diameter. It is not inversely proportional to the square of this diameter as is erroneously stated in many standard textbooks on colloidal chemistry.

We must now introduce an important exception in regard to specific surface. When this surface becomes too large the particle reaches a state of fine subdivision where it fails to act normally and commences to scatter light instead of reflecting it. The optimum size for reflecting efficiency is equal to one-half the wave length of the light incident upon the particle. For practical purposes this dimension is about .25 micron (a micron is 1/1000 of a millimeter). It can be readily seen, therefore, that truly colloidal particles are entirely too small in diameter to act as good delustering agents. Unfortunately, quite a few inventors have failed to recognize this fact.

When no fixed difference between the refractive indices exists as assumed above, then a third factor enters the problem. The amount of diffusely reflected light now depends (as a first approximation only) on the product of specific surface times percentage weight of pigment times the efficiency of the diffusing surface. This last quantity can be shown to be equal to the cosine of the critical angle. When the differenice in refractive indices is zero, the critical angle becomes 90 degrees and its cosine is zero. Therefore, the product of the three factors is zero and no light is diffusely reflected.

In summarizing the optical principles for internal delustering it can be stated:

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PROCEEDINGS OF THE
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New Possibilities in

Wool Scouring*

By **N. D. HARVEY, Jr.**
Carbide and Carbon Chemicals Corp.

TODAY industry is more keenly interested than ever before in improving its efficiency, in developing new methods, new products, and new markets. The textile industry is bending every effort to arouse itself from the doldrums to which it has been subjected for too long. Its attention has been concentrated on mechanical, chemical, and marketing improvements. In fact, every detail of manufacture and sale is a potential subject for careful investigation. With all its earnest effort, one important phase of processing has not as yet received the consideration to which it is entitled in view of the part it plays.

It is the purpose of this paper to briefly touch upon the relation of stock lubrication to manufacture, and to call attention to more desirable properties in lubricants, which, if attainable, would materially ease the burden of the spinner, dyer, and finisher. The lubricant applied to wool, worsted, mohair, rayon, and such fibers, directly effects efficiency in every department of the plant. Proper lubrication is essential to successful manufacturing, but improper lubrication will show up as trouble all along the line. Too frequently a saving in the price per pound of the lubricant has actually increased the processing cost.

The practical functions of stock lubrication are well known, but will be briefly described. The lubricant applied to fibers produces a surface film upon which the fibers may slide during the untangling, straightening, combing, and drawing operations. A definite softening

*Presented at May 13th meeting of the Northern New England Section.

and flexitizing is obtained which decreases the brittleness of the comparatively dry fibers and prevents unnecessary breakage. The surface serrations of wool are protected, and contact between fiber and metal pins is reduced. Wildness of stock denotes the presence of static electricity resulting from friction and a dry condition. A lubricant should create a resistance to drafting which will insure even, smooth roving with the fibers holding compactly together. Without this resistance, the stock is wild and lofty, and drawing is uneven because the fibers give too freely under tension.

It is common knowledge that "hot" or freshly combed top is wild and full of electricity. This charge has been developed by a friction, undoubtedly between fiber and metal pin, which has not been overcome by lubrication. Wool combed on the Bradford system generally carries about 3 per cent of a lubricant. It is true that the material can be and is applied uniformly and evenly, and, particularly in emulsified form, is well distributed and penetrative. It is hardly to be expected, however, that the relatively small quantity applied will cover all exposed fiber surface. The area represented by one hundred pounds of stock is very large. The result is that friction develops from the unlubricated surfaces, and an added responsibility should be assumed by the lubricant to compensate for the insufficient quantity used. Oils as lubricants cannot be condemned because they have proven their worth over a period of many years. It is not the purpose of the following discussion to destructively criticize oils, but rather to point out the physical and chemical properties which do not lend themselves to present manufacturing methods. Only by a consideration of these features can honest attempts be made to eliminate the extra operations and extra expenses incurred by these properties.

Oils possess the required lubricating ability because they are of sufficient molecular size to remain on the surface of the fibers without being absorbed. They provide the desired softening and flexitizing action and serve as a slippery cushion upon which the fibers may slide. But oils are not conductors of electricity and therefore are unable to dissipate charges as they develop. Oils do not mix with water and do not decrease the evaporation rate of water to the same extent as do soluble substances. Fatty oils which are satisfactory from the standpoint of low rates of oxidation are not sufficiently viscous and bodied, and for best spinning results require oxidizing to a higher viscosity through the medium of storage in a conditioned atmosphere. Ageing also imparts moisture to the dry stock, dissipates electricity, cools, and sets the fibers. The more viscous oils oxidize too rapidly and become more resinous. In this condition they become increasingly difficult if not impossible to remove. Increasing the efficiency of less viscous oils by the use of larger quantities has not proven entirely satisfactory because the degree of gumminess is increased through oxidation of this larger quantity. So much for lubricants as they may concern the comber and spinner.

Being insoluble in water, thus forming a water impervious film upon the fibers which resists the penetration of carbonizing, bleaching, dyeing, and finishing solutions, oils must be removed before each of these processes. The usual procedure is soaping to remove the oil, grease, and accumulated dirt, and then rinsing to remove the soap. Soaps emulsify oils to form emulsions in which finely divided oil droplets are dispersed in water. As the emulsion is drained from the machine through the bottom, there is a tendency for the yarn or cloth to filter and adsorb a portion of the oil, particularly if complete emulsification is not obtained. To obviate later difficulties from this source, several soapings may be given. It is important that sufficient alkalinity be maintained during washing to prevent the breaking of the soap by the acidity of wool. In this case, free fatty acid would be adsorbed by the fibers and would not be removed except in alkaline rinse solutions. The presence of soap will be as detrimental to bleaching, carbonizing and dyeing as is oil, and it is essential that plenty of time be given to thorough rinsing and removal of soap. The pitfalls of faulty washing and rinsing have been emphasized because here is one of the most serious causes of imperfect goods. With all the lengthy soaping and rinsing generally resorted to insure against dyeing difficulties, it must also be borne in mind that too much handling and processing carries with it the possibility of harshening of the material and unevenness. Thus, the dyer and the finisher are seriously concerned with the type of lubricant used.

To summarize the desirable and the undesirable features of present lubricants, and without condemning them for their shortcomings, they possess lubricating ability of high order; contribute a softness and flexibility which decrease fiber breakage; are inexpensive; are non-corrosive; and are non-toxic. On the other hand, they are insoluble in water; must be removed for dyeing and finishing; are odorous when of fatty nature; are non-saponifiable and difficult to emulsify when strictly mineral in origin; are non-conductors of electricity; and require storing for several weeks for best spinning. Over a period of months, oxidation has proceeded to the stage of resinification which complicates spinning and increases washing difficulties. The fact that fatty oils oxidize limits the quantity which may be applied since too much will produce undesirable gumminess.

By including the desirable and correcting the undesirable features of present lubricating materials, one may arrive at the general properties which would be found in the ideal lubricant. It would possess the lubricating ability of partially oxidized olive oil. Partially oxidized oil is mentioned in preference to the fresh material because

aged top and aged roving are preferable to fresh top and fresh roving. This preference is not due entirely to the fact that ageing dissipates static, provides moisture, sets, and cools the stock, as if true, ageing would replace oiling. One of the most important benefits of storage is the increased viscosity imparted to the oil through partial oxidation. A lubricant of proper viscosity but lacking gumminess, and which is a conductor or electrolyte, might possibly eliminate the necessity for ageing without sacrificing spinning efficiency. The ideal lubricant would possess the ability to soften, flexitize, and protect the fibers; would be non-corrosive, non-toxic, odorless, colorless, non-gummy, and non-drying. It would be non-injurious to fibers, would be completely soluble in water to a clear solution, resistant to acid solutions of carbonizing strength or at least decompose into harmless ingredients. It would be resistant to hard water, and stable in soap solutions. Such properties would materially decrease, of not eliminate, the necessity for long washing and rinsing to insure oil free material and uniform processing. It would be a good electrical conductor, thus reducing stock wildness and facilitating manufacture. It would not oxidize or become gummy, and thus would not be a source of trouble if goods "in oil" are stored for extended periods of time.

It is clear that present lubricants are not satisfactory from all angles, nor is anything perfect or incapable of improvement. But they are the best of the available materials. Compounds closely approaching in properties those of the ideal lubricant described have been synthesized and have been used successfully in experimental quantities under plant operating conditions. The advantages to be gained by the use of such a synthetic chemical appear to be of sufficient importance to combers, spinners, dyers, and finishers, to warrant serious thought and extensive investigations. An odorless, non-staining, water-soluble lubricant not requiring washing for dyeing, would solve one big problem in the knitting industry. The elimination of soaping for piece dyed knitgoods would minimize shrinkage and faulty dyeing. For fabrics sold in the unscoured condition, the lack of odor is essential, while non-staining features will allow the use of sufficient lubricant to obtain efficient combing and spinning. The clean, white freshness of top containing a colorless and odorless lubricant is an asset and dispenses with backwashing. The elimination of ageing decreases inventory expenses and losses, while the dyeing of goods without a preliminary soaping removes one cause of uneven work which is just as important as the economies realized in time, labor, and power charges.

Without question, if the need for such a compound exists, that compound will be developed, and if this brief discussion has truly represented the possibilities resulting from these improved properties in lubricants, its purpose will have been accomplished.

Discussion

Dr. Chapin: What did you call the new lubricant?

Mr. Harvey: For the time being, we feel that it is advisable not to divulge the exact nature of these new materials. Our work is still experimental and our tests involve many different members of the same chemical series. By suitably controlling the reaction, compounds are obtained which vary from a thin liquid consistency to oily, viscous materials similar to the sample I have here. I have brought with me sample tops made at the Lowell Textile Institute which illustrate the various fiber drawing effects obtained with two new materials as compared to olive oil. These may be examined for lack of static and wildness, lack of odor and of color, and for the smoothness of drawing as the fibers are pulled. The fact that there is a very nice, slippery film upon which the fibers slide, as with aged oils, leads us to believe that we can duplicate the effect obtained with oils. That is, ageing of oiled stock is preferable from the standpoint of drafting and spinning. This preference is due in part to the increased viscosity of oil after oxidation during ageing. It takes a few weeks for this oxidation, and we obtain the same result almost immediately.

Dr. Chapin: How can you get the very fine state of distribution that you get by emulsifying ordinary oil?

Mr. Harvey: I believe the distribution should be better with these materials because they are not dispersions, they are true solutions. In a dispersion of oil, the small droplets are distributed through the mass of water but not dissolved. With this material a true solution is obtained as with alcohol in water.

Mr. Moorhouse: Is it a conductor of electricity?

Mr. Harvey: Yet it is.

Mr. Moorhouse: Is it stable?

Mr. Harvey: It is not stable in strong alkalis as it would hydrolyze. It is stable in acid solutions and we have been able to dye worsted serge and mohair plush without removing the lubricant. It will also stand peroxide bleaching.

Mr. Grimes: About how acid is the material itself?

Mr. Harvey: The material itself as manufactured contains about 1 per cent free acidity which is neutralized for use. Its p^H would run around 6.0, possibly a little lower. The use of sodium bicarbonate allows the regulation of the p^H to 7.0 to 7.5.

Mr. Grimes: Will that effect the alkalinity?

Mr. Harvey: To inhibit corrosion, the material would be made slightly alkaline, at about 7.5.

Mr. Grimes: Even though it may combine with the natural water in the wool, would it still stay on the alkaline side or on the acid side?

Mr. Harvey: The tendency would be toward the acid side due to hydrolysis. The time required and the extent to which this would occur in normal practice are data that

I do not know at the moment. Of course, we are very particular about corrosion as this is a very important consideration. Faller pins left immersed in the lubricant as used have shown no signs of corrosion over a period of ten weeks.

Mr. Derby: How does it affect soap solutions?

Mr. Harvey: The new lubricants will affect soap solutions just as do weak acids. The quantity of libricant present on worsted, wool, mohair, and rayon waste, is not sufficient to seriously affect soap solutions. If a reaction does occur, free fatty acid will be split from the soap. This would not be objectionable in wool fulling, for example, as the alkali present will take care of the fatty acids. The worst that could happen would be a use of sligthly larger quantities of alkali.

Dr. Chapin: To what extent does it limit the evaporation of water from the wool after it is applied? Is it hygroscopic?

Mr. Harvey: The material is only slightly hygroscopic if at all. It is not as hygroscopic as the glycols. It will probably decrease the evaporation rate of water as the boiling point of its water solutions will be higher than that of water itself.

Dr. Chapin: That may be an advantage. I have heard of glycerine being added.

Mr. Harvey: Diethylene glycol has been considered a very hygroscopic material, and we find that it will add from 20 to 30 per cent of its own weight. Five per cent in cloth or yarn would add 1 per cent of water which to me would not be particularly important. If something would hold its own weight or twice its weight of water, it would have distinct advantages. I know of nothing as hygroscopic as that which could be used.

Mr. Grady: It is your idea that lubrication could minimize the scouring necessary? Will it cost more than the ordinary lubricant?

Mr. Harvey: It probably will be somewhat more expensive than olive oil, but the economies that it realizes should more than outweigh the increased cost. If stock processes more smoothly and more quietly, and if the top is clean, white, and odorless, and if scouring and rinsing are minimized, and if it is possible to bleach, carbonize, and dye without scouring, these advantages are important and involve considerable savings in time and trouble. With the new lubricants, cloth containing them will dye as uniformly as if scoured.

Mr. Grady: Is that piece dye?

Mr. Harvey: Anything you wish, top, slubbing, yarn, or piece.

Dr. Chapin: Have you been spraying it on the wool as it comes from the dryer?

Mr. Harvey: For our tests at the Lowell Textile Institute, we have been dropping the lubricant on the stock. In plant tests, the material is sprayed on at the end of the dryer, and some more may be added for preparing before combing.

Dr. Chapin: Couldn't you put it in the last bowl before it goes to the dryer? I believe that being acidic, it would prevent the wool from going to the dryer alkaline. You know it is common practice to use acidifying materials in the last bowl.

Mr. Harvey: It could be done. But wool coming out of the last bowl must hold at least its own weight of water, and in order to put in 3 per cent lubricant, it would be necessary to use a 3 per cent solution. I would say that this would not be practical because of the cost.

Mr. Moorhouse: What is the strength you have been using, or are you applying it in water solution?

Mr. Harvey: We have been applying about 3 per cent to wool, using water solutions where desired, or applying the compound straight. Most mills in which I have worked prefer to use the undiluted lubricant. Water solutions and emulsions seem preferable to me as they have better spreading properties.

Mr. Morrison: A good many plants use water emulsions.

Dr. Chapin: Why would you use more before the dryer than you would after?

Mr. Harvey: You would not use more. My point is that waste would occur from the overflowing of the bowl and dripping when the lubricant was applied from the scouring machine. I do not believe that this method would have advantages over atomizing at the end of the dryer.

Mr. Nutting: What effect would the temperature of the drying of the yarn tend to have on the material?

Mr. Harvey: We have conducted evaporations at 100 degrees C. for ten days. The loss in that time remained constant after 12 per cent.

Mr. Nutting: Is there decomposition of the remaining material?

Mr. Harvey: There is a slight darkening.

Mr. Derby: Have they any increased affinity for acid dyestuffs?

Mr. Harvey: That I do not known. We have not seen a marked difference between the shades of scoured goods and the same unscoured and containing the new compounds. If we could use an acid lubricant, possibly that acidity would give an increased dye affinity. It is a question whether such a condition is preferable to corroded pins.

Mr. Nutting: Stock lubricated with oil generally wets with more difficulty than unoiled stock. What is the effect of this material regarding wetting out properties of the stock? Are they enhanced any or not?

Mr. Harvey: The material is not a surface tension depressant. Stock lubricated with it should wet out as does scoured stock, and therefore better than oiled stock.

Mr. Nutting: What is the quality of yarn spun with that material as compared with olive oil?

Mr. Harvey: Our tests to date have been confined to the art of combing and spinning. We have made no comparative tests on the yarns.

Question: You believe that the conductivity of the new lubricants is quite important?

Mr. Harvey: Yes, I do. By way of illustration, one plant accustomed to dropping water on the stock during combing because of wildness, found that with our new compound, this static was eliminated completely and no water was required. The efficiency of the combing room was markedly increased.

SPRING MEETING, SOUTHEASTERN SECTION

May 20, 1933

E. A. FIEMSTER, JR., Chairman, called the meeting to order and Mr. E. H. Leonard of the Valway Rug Mills, La Grange, Ga., gave an excellent talk on the "Dyeing and Finishing of Chenille Yarns." He had a great many samples and the examination of these created real interest.

The Dyeing and Finishing of Chenille Yarns*

***By* A. H. LEONARD**
Valway Rug Mills, Inc., La Grange, Ga.

THE dyeing and finishing of chenille yarns being somewhat broader than I intend discussing, I shall confine my subject to "The Skein Dyeing and Finishing of Cotton Chenille Yarns." Much of my experience as concerns skein dyeing of chenille being in direct and vat colors, I shall deal with the application of these two types of colors on cotton chenille yarns.

Most of our skein dyeings of chenille are made on the open rotating and oscillating spindle Monel metal machine.

Our wetting out is done on the closed circulating liquor type skein dyeing machine using a mix containing sulfonated castor and pine oil. Some of the advantages of this arrangement of using the closed type of machine for wetting out are:

a. Increased production on the more expensive type dyeing machinery.
b. Practicability of shorter liquor in closed type.
c. Quicker wetting out. (Much time would be consumed in getting the wetting started on the open type machine, due to the trouble in getting the natural yarn to sink.) Also, there is much liability of reel breakage where glass reels are used.
d. Operators on dyeing machines can run more spindles where the yarn has already been prepared for dyeing.

After the chenille yarn is wet out, it is unloaded from the machine onto racks and from these racks to carts. It is then given a light whizzing.

The yarn is then loaded evenly on the reels of the dyeing machine. The machine is divided into sections of ten spindles each. About five pounds of material is loaded per spindle. Each section constitutes one batch. If several sections are thrown together, difficulties, especially in combination shades, may be had due to gradual shading from end to end in the machine caused by excessive length of machine.

Some essentials for desirable results, which I consider even more important on chenille yarns than on ordinary yarns, due to the nature of their construction, are a proper selection of color combinations and suitable working colors for this type of yarn and dyeing. Colors which are widely different in shade are avoided in combination where it is possible to do so. Their rate and nature of exhaustion are considered and in the case of vats their rate of oxidation and their chemical character is important. It is desirable to avoid the combinations of indigoids and anthraquinones or any two types of vat colors of too great a contrast in either chemical character or shade.

In direct dyeings the dyestuffs are boiled up and entered into the dye bath. The bath is then brought to the required temperature by steam and the material entered. Salt or Glauber's salt is added and well mixed in the required amounts and at the desired intervals, the yarn

*Presented at meeting, Southeastern Section, May 20.

being raised out of the bath for this purpose. The time of dyeing of direct colors is usually an hour.

In the dyeing of vat colors, the powdered dyestuffs are pasted with a mixture of sulfonated oil and pine oil in buckets and reduced at the required temperature. The use of pine oil or similar agent in the dye bath we consider important, because of its effects in reduction of surface tension in the dye bath, this aiding in the prevention of surface oxidation.

The yarn is sprung in the machine for about ten minutes with caustic soda, glue or substitute, and a small amount of hydrosulfite. The yarn is then raised and salt or Glauber's salt added when required. Then the balance of the hydrosulfite is added to the bath and mixed well, after which the reduced dyestuff is added and the dye bath is brought to the starting temperature by steam from open coils, yarn is lowered into liquor and dyeing begins. In most cases on medium and light vat shades, the dyeing time is around thirty minutes. The time of dyeing is necessarily short, as the continuous exposure of the yarn to air causes a rapid breaking down of the bath resulting in streaked and uneven yarns whose fastness would be impaired by the precipitation of unfixed color so thrown on the fibers. Hence, the level of dye liquor is made as high as is expedient with good running conditions of the yarn. For this reason, also, vat dyeings are made in an over-reduced bath. When the dyeing is completed, the liquor is let off and the material is allowed to continue to turn about ten to fifteen minutes, in order to prevent shading of skeins. This also aids in oxidation of the yarns.

Some of the vat dyed yarns are thoroughly rinsed cold and given a soaping at 180 to 190 degrees F. without any perborate or chemical oxidation; however, it is necessary in some cases to treat the dyed chenille with perborate before soaping and, with some colors which are sensitive to alkali, it is best to sour with sulfuric acid. The rinse waters assist in oxidizing the vat dyed yarns by washing off the dye liquor and by the air which they contain. Care must be taken, however, that the yarns are well oxidized and washed before soaping or much variation of shade from batch to batch will result.

In the case of some pastel vat shades on chenille yarns, a preliminary bleaching is given in the closed type circulating liquor machine, using 100 volume hydrogen peroxide. The yarn is first given a wetting out and raised out of the machine. The bleaching liquor is prepared in the machine using five pounds of sodium silicate and three quarts of 100 volume hydrogen peroxide per hundred gallons of liquor. The silicate is first put in and mixed and the hydrogen peroxide then added. The bath is brought to 120 degrees F. and the yarn entered. Temperature is raised to 190 degrees F., which has been found to give good results. The material is run in the bleaching bath for around three hours, obtaining about a three-quarter bleach. The bleaching liquor is let off and the batch is washed well at around 180 degrees F. after which it is unloaded and given a light whizzing. Too much whizzing tends to pack the yarns. This packed condition, if not remedied before dyeing, will cause light spots in the dyeings as there is not enough agitation of the yarns in the dyeing process to open the skeins out properly. More hydrosulfite is required in the dyeing of these bleach bottom goods. A comparative shade on these bleach bottom vat dyed yarns probably requires about 10% to 15% more color than would be required on natural bottom yarns. This is due largely to better penetration and brilliancy of bleached material. Also probably to some coloring effect of the natural yarn. Very good leveling and penetration may be obtained where suitable selections of vat colors are made. We have found that on pastel shades, where exceptional evenness is required, some of the cold dyeing type vat colors, where desirable range of shades is available, give best results in levelness and penetration on skein dyed chenille yarns. However, the dyestuff costs run higher.

After soaping, the yarns are then well rinsed and unloaded onto carts, each batch being separated from the others by cords or strings. They are then whizzed and loaded onto racks, ready to be dried. The yarn is straightened and spread out on sticks which are placed on racks and then removed to the driers where they are dried at 200 to 220 degrees F. Bleach cotton dyed yarns are dried at much lower temperatures.

After drying, the yarn is unloaded and bundled into hanks. These hanks are then tied in bundles. Each bundle consists of fifty pounds or one batch. Each batch is kept separate from the beginning of the handling in the wetting out until the final bundling up of the dried colored yarn. Equipment is so arranged that the processing begins in one end of the dyehouse and proceeds step by step to completion in the other end.

New uses of chenille yarns are continually being found. Some of their uses are in woven and braided chenille rugs, chenille towels, bath cloths and bath mats, hooked rugs, draperies, sweaters, trimming on ladies' dresses, baby clothes, millinery, novelties, bathrobes and so on in great variety.

We believe that as yet the surface has only been scratched in the wide variety of uses to which they may be applied.

Robert Harris of the Spalding Knitting Mills led the discussion.

Discussion

Question: How is the weight of yarns affected by the severe boiling out?

Answer: Lack of agitation and careful control keeps the weight loss down very low.

(Continued on page [242] 422)

Make your plans NOW.....

Annual Convention in Chicago

SEPTEMBER 8 and 9

American Association of Textile Chemists and Colorists

COMMITTEES

Technical Papers
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Entertainment
Elmer F. Smith

Reception
A. J. Feit

Publicity
A. T. Brainerd, E. A. Johnson

Proceedings of the American Association of Textile Chemists and Colorists

DINING AT CHICAGO'S WORLD'S FAIR

THROUGHOUT many of the dining places at The Century of Progress the spirit and influence of the Old World prevails. On the very rim of the lake is Old Heidelberg which has a capacity of about 1500 in its distinctive dining rooms and 2500 more in its outdoor gardens. Flaxen-haired Teuton waitresses in short, flaring skirts, gaily colored, and ornamented with fine needle work serve in two of its large Old World dining rooms decorated in the many knotted pale woods so familiar in Germany. Helping the waitresses are a crew of young German men in knee pants and gay coats. There is an excellent orchestra and typical German dishes such as sauerbraten, linzentorte, and baumkuchen are served.

Victor Vienna Garden is under the direct management of Victor Diesenhofer, one-time chef for the late Emperor Franz Josef of Austria The cafe will specialize in the foods that have made Vienna's name known throughout the world. It offers such delectables as wienerschnitzel, lungenbratengoulasch, rindfleisch, tafelspotz, paprika huhn, mehlspeise, souffles and tarts and those glorious desserts made from the flours. The famous Vienna coffees and beer are served.

One of the joyful dining places is in the Belgian Village. This cafe, operated by Belgique Pittoresque under George M. Potie, is in a medieval setting. Months ago casts were taken of ancient cottages in Flemish and Belgian villages dating back hundreds of years. From these moulds exact duplicates have been cast. Blonde Belgian girls serve while dog carts rattle over cobbled streets. Famous Belgian and Flemish dishes are served, jambon d'ardennes, poussaine, that marvelous dish made of very infant chicken en casserole, omelette souffles, etc., and those rare roasts which are a gift of Belgian cookery.

Contrasting with this, down on the central part of the Midway, is Adobe House. Flat roofed, beamed with a patio, a veritable corner of the desert Southwest, typical of the Navajo country, the food specialty is pit-barbecued beef, mutton, kid and chicken.

Miller's Hy-Life Fish bar brings a variety of hot dishes: chowders, clam gumbos, shrimp and the various delicacies of the salt seas, including crabs and other shellfish, and, of course, beer.

Or you can eat as Lincoln ate, if you wish, at the Rutledge Tavern. Abraham Lincoln, in his younger years, was a regular patron at the old Rutledge Inn and it was here that he met and courted Ann Rutledge. The Rutledge Tavern stands in the Lincoln group containing replicas of Lincoln's birthplace and boyhood home. You will hear everyone talking about the delicious meals served there in surroundings of a pioneer era of a century ago.

Colorful dining places are found in the Streets of Paris, reproducing the shops and boulevard cafes of old Paris. There is dancing there, too, and the restaurateurs, waiters, entertainers and other attendants are garbed in picturesque French attire.

There is also a real circus cook house, a Chinese cafe serving Oriental foods, an Italian restaurant, native foods in the Swedish lunch room, in the Polish Pavilion, in the Czecho-slovakian restaurant, and the Moroccan Village.

Ben Bernie, Buddy Rogers and other famous musicians lead the orchestras and broadcast from Pabst Blue Ribbon Casino, one of the most popular places at the Fair. Famous College Inn cuisine is served under the management of Ernest Byfield and Frank Bering of the Hotel Sherman.

Lunch stands and sandwich shops abound for the food concessions have been planned to meet every taste and purse. All are under the strict supervision of Dr. Herman Bundesen, the director of health of the exposition.

You have a magnificent choice of what to eat and where to eat it at the World's Fair and in no other place in the world is this available within an era of three and one-half miles.

Proceedings of the American Association of Textile Chemists and Colorists

UNEMPLOYMENT REGISTER

Members of this association, who are without employment, should forward to the secretary a statement as to their qualifications and experience. This information will subsequently appear on these pages with an identifying key number. Employers are also requested to file with the secretary any vacancies which may occur in their businesses.—A. Newton Graves, Secretary, care Franklin Process Company, Providence, R. I.

Key: A—Laboratory and research; B—Dyeing or printing; C—Finishing; D—Sales; E—Instruction; F—Executive

A-1

Education—Ph.B., Brown Univ. '27, P.G. at N. C. State (M.S. this June).

Experience—several years experience as an analytical and research chemist; private research work on sulfonated oils. Twenty-seven years old, married. Will supply references.

A-2

Education—B.T.C., Lowell Textile Institute, 1932; also course in shorthand and typing.

Experience—None to date, interested in quantitative analysis, experimental dyeing, color matching, dye testing and dye identification. Ability to learn quickly and will go anywhere. 23 years old, single.

A-3

Education—Graduate Pratt Institute, also attended Brooklyn Polytechnic.

Experience—12 years laboratory work with dyestuff company, also chemist with chemical company conducting manufacturing and research on sulfonated oils, soaps and specialties. Practical and laboratory experience in the manufacture of textile and leather specialties and starches. Married, 29 years old.

A-B-1

Experience—over twenty years' experience in the laboratories of various chemical manufacturers, four months' experience as second hand in dye house, familiar with all types of dyes and fibers. Thirty-nine years old. Will supply references.

A-B-2

Education—Lowell Evening Textile School, 1917.

Experience—Five years' experience in hosiery dyeing, full fashioned hosiery of silk and cotton and silk, also men's hosiery containing rayon, wool, cotton and celanese. Several years experience in laboratory work. Has also had experience in jig-dyeing of cotton piece goods, slub and top dyeing.

A-B-3

Education—Graduate in chemistry and dyeing of Textile School, Krefeld, Germany.

Experience—2 years plant chemist, handling vat, diazo, and direct fast colors on rayon; 3 years as dyer on piece goods, crepes and all mixtures of celanese, rayon and silk, pure dye and weighted. Age 27, single, will go anywhere. References.

A-B-E-1

Education—B.S. in chemistry at C.C.N.Y. Working now on M.A. at Columbia.

Experience—7 years as dye tester and color matcher for dye manufacturer; 6 months skein silk and rayon dyer; 4 years textile chemist and dyer for cotton finishing concern; 2 months boss bleacher and 4 years as teacher of organic chemistry and dyeing. Age 38, single.

A-E-1

Education—Ph.D., Univ. of Illinois, studied chemical engineering at Columbia, licensed chemical engineer, New Jersey.

Experience—10 years' experience teaching in colleges, subjects included chemical and textile subjects. Has had broad experience in industrial work including experience in testing materials, research and consulting. Will go anywhere; references.

A-E-2

Education—B.T.C., Lowell Textile Institute, 1933.

Experience—Assistant instructor in chemistry, Lowell Textile Institute. Member of scholastic honorary fraternity.

B-1

Education—educated and trained in chemistry and calico printing in Glasgow, Scotland.

Experience—Has been with large print works as colorist for 13 years producing first class work on cotton, rayon, wool and silk fabrics. References.

B-2

Experience—Boss dyer with one firm for 18 years, divisional supt. at print works for 1 year, in charge of processing and dyeing of cottons and rayons at large bleachery for 6 years. Prefers bleachery in East but will go anywhere. References.

B-3

Experience—Foreman piece dyer for the past 21 years. Can dye the following; celanese, rayon, cotton backs, wool, silk and mixed fabrics. Has knowledge of finishing and laboratory work.

B-4

Experience—Overseer of cotton and rayon piece dyeing. Familiar with all machines and all classes of colors. Has knowledge of chemistry, was at one time demonstrator of chemistry and dyeing at Manchester (Eng.) Institute of Technology. Prefers N. E., N. Y., N. J., or Penn., but will go anywhere. Fifty-two years of age.

B-5

Experience—Nine years of yarn dyeing on rayon, silk, cotton, and novelty yarns with acid, direct, vat and naphthol colors. Experience in yarn printing, fastness tests and also on dyeing silk piece goods and rayon knit goods. Will go anywhere; references.

B-6

Education—Graduate R. I. School of Design.

Experience—5 years in bleachery, 7½ years as assistant dyer, 2 years as boss dyer and 3 years as superintendent of dyeing and finishing. Married, 33 years old. References.

D-1

Education—Graduate textile course, 1911, Georgia School of Tech.

Experience—Has had experience in all branches of the textile industry but chiefly in sales work. Was at one time in the dyestuff business and later in hosiery manufacturing. Prefers Middle Atlantic or southern states.

F-1

Education—Textile Institute, Alexander Hamilton Inst., Extension work at Brown Univ., working knowledge of German.

Experience—Has had executive departmental work with all types of textiles manufacturers. Acquainted with all types of textile machinery, dyestuff application, laboratory practice, cost methods, and checking methods and processes. References.

B-D-F-1

Experience—Has held positions as general superintendent of a print and dye works and a finishing company; held a position as boss dyer in a bleachery for 6½ years and as a colorist on 11 printing machines for 3½ years; has held a position as boss dyer for 6½ years with a finishing company and received general training for 3½ years; and has also been dyer in a mill dyehouse. Desires position as superintendent, colorist, dyer or salesman and solicitor.

THE DYEING AND FINISHING OF CHENILLE YARNS

(Continued from page [238] 418)

Question: How about penetration and wetting out agents in the dyeing of these yarns?

Poor penetration is secured unless yarns are thoroughly boiled out.

The bleach-bottom yarns give lighter shades as a rule than those formulae using the "regular boil out."

Question: How about sulfur dyes on these yarns?

Answer: The sulfide baths make the yarns quite harsh and this has not been overcome successfully.

As there were no further questions, the chairman introduced Dr. Robert E. Rose, the president of the Association, who gave a very fine and instructive address on "The Dyestuffs Laboratory and Cotton Dyeing." He stressed the relation that the practical mill chemist and practical dyer bears to advancing the research on the most valuable lines and the assistance all mill men can give by their observations and talks.

His explanation of the functions of the research chemist was quite interesting.

A rising vote of thanks was given the speakers and officials for the excellent program and Dr. Rose was asked to visit our Section again at his earliest convenience.

Members were asked to pay up dues, re-instate their memberships and try to secure new members.

Attendance: about 75.

Respectfully submitted,

CHARLES B. ORDWAY,
Secretary.

OUTING, NEW YORK SECTION

THE North Jersey Country Club was a scene of the annual outing for the New York Section on June 23rd. Arthur Wiehl arranged an interesting program of golf, tennis and horseshoes.

At the dinner, Chairman Herrmann presented prizes for the events. Paul A. Dunkel won the low gross prize with a score of 80. The net score, carrying the Section Championship Cup, was turned in by Pat Kennedy, who scored a net 71. The guest prize went to O. S. Gill. The Horseshoe Pitching Trophy was won by Ephriam Freedman.

The New York Section evidently did not boast of many tennis players although an exhibition was given by genial Chairman Arthur Wiehl, George Baxter and Clem Hoppe. The net results seemed to show that they are better chemists and colorists than tennis players.

At the dinner Baxter and Gill entertained with songs and the applause showed that their singing was even better than their tennis and golf games. The dinner adjourned about 10:30 although many members remained to talk over the good times they had during the day.

Respectfully submitted,

THOMAS R. HARRIS,
Secretary

APPLICANTS FOR MEMBERSHIP

Active

Edward T. Mobley, Demonstrator, General Dyestuff Corp., Charlotte, N. C. Sponsors: A. L. Randolph and S. H. Williams.

Charles L. Simon, Textile & Commodity Research, Industrial By-Products Research Corp., Gimbel Bldg., 8th and Market Sts., Philadelphia, Pa. Sponsors: Alex. Morrison and A. Newton Graves.

Max Einstein, Salesman, P. O. Box 211, Charlotte, N. C. Sponsors: George P. Feindel and Hugh Puckett.

Joseph Lindsay, Jr., Textile Chemist, General Dyestuff Corp., 1101 South Blvd., Charlotte, N. C. Sponsors: Hugh Puckett and H. A. Barnes.

Frederick E. Sprock, Salesman, Geigy Co., Inc., Charlotte, N. C. Sponsors: Joseph S. Lange and Harold M. Sprock.

Alfred C. Quance, Dyer, American Woolen Co., Winooski, Vt. Sponsors: Elliot Backup and Henry D. Grimes.

William H. Turner, Overseer, Rayon Dyeing, Hampton Co., East Hampton, Mass. Sponsors: Everett H. Fuller and I. N. Stronach.

George N. Houth, Color Shop Worker, American Printing Co., Fall River, Mass. Sponsors: Maurice D. Frazee and Harold C. Bloxham.

Anthony F. Costello, Chemist, Dyer & Finisher, Marshall Field & Co., Robinson Ave., Pawtucket, R. I. Sponsors: Hyman P. Selya and John C. Tebbetts.

Eric C. Kunz, Manager, Givaudan-Delawanna, Inc., 80 Fifth Ave., New York City. Sponsors: Joseph F. X. Harold and A. Newton Graves.

Charles A. Thornhill, Dyer, Dartmouth Woolen Co., Claremont, N. H. Sponsors: Edward Weber and A. Newton Graves.

Junior

Elmer F. Akers, Control Chemist, Beaver Chemical Works, Inc., Damascus, Va. Sponsors: John L. Crist and Hugh Puckett.

James C. Lague, 316 Summer St., New Bedford, Mass. Sponsors: F. E. Bushby and A. Newton Graves.

James A. Camelford, Bleacher, Dyer & Finisher, Dominion Fabrics, Ltd., Dunnville, Ontario, Canada. Sponsors: W. H. Turner and T. Jackson.

George S. McCarty, Assistant Chemist, Dixie Mercerizing Co., Chattanooga, Tenn. Sponsors: A. Newton Graves and Harold Schroeder.

EIGHTY-NINTH COUNCIL MEETING

THE Eighty-ninth Council Meeting of the American Association of Textile Chemists and Colorists was held at the Chemists' Club, New York, N. Y., April 28, 1933, at 1:30 P. M.

The following were present:—

President: R. E. Rose.

Vice-President: Wm. H. Cady.

Treasurer: Wm. R. Moorhouse.

Councilors at large: Ralph F. Culver, Carl Z. Draves.

Councilors: Roland E. Derby, Hans Meyer, L. A. Olney, Chairman, Research Committee.

Secretary: A. Newton Graves.

The report of the last meeting was read and approved.

The Secretary's balance sheet was read as follows and approved:—

Secretary's Balance Sheet—April 26, 1933

Cash on hand, March 29, 1933			$670.77
Receipts, March 29, to April 26, Incl.:			
Applications	5 @	$5.00	25.00
Applications	3 @	2.50	7.50
Dues (1933)	42 @	5.00	210.00
Dues (1933)	3 @	2.50	7.50
Dues (Corp.)	1 @	200.00	200.00
Dues (Arrears)	1 @	2.50	2.50
Analytical Methods	22 @	.75	16.50
Analytical Methods	2 @	.81½	1.63
Year Book	1 @	3.00	3.00
Interest			.33
			$1,144.73
Disbursements:			
To Treasurer, April 26, General Fund			$600.00
To Treasurer, April 26, Research Fund			200.00
Government Tax on checks			.02
Check returned due to banking holiday			5.00
Cash on hand, Nat'l Bank of Commerce and Trust Co.			339.71
			$1,144.73

The Treasurer's report was read as follows and approved:—

Treasurer's Report—April 27, 1933

GENERAL FUND

Cash on hand—March 30, 1933	$8,072.77
Receipts—March 30, 1933, to April 27, 1933	600.00
	$8,672.77
Expenditures—Mar. 30, 1933, to Apr. 27, 1933	1,110.52
Balance	$7,562.25

RESEARCH FUND

Cash on hand—March 30, 1933.....	$1,014.42
Receipts—March 30, 1933, to April 27, 1933.	2,350.00
	$3,364.42
Expenditures—Mar. 30, 1933, to Apr. 27, 1933	135.15
Balance	$3,229.27

BANK BALANCE

General Fund	$7,562.25
Research Fund	3,229.27
	$10,791.52
First National Bank—Checking Account....	$4,415.32
First National Bank—Savings Account.....	6,376.20
	$10,791.52

The following were elected to membership as of thirty days after the publication of their names provided no objections to any are received by the Secretary:—

Active

Corn, W. T.—Cleveland, Tenn. Vice-President and General Manager, Manufacturers Soap & Chemical Co.

Funke, Carl A.—52 East 41st St., New York, N. Y. Secretary, Nova Chemical Corp., 200 Hudson St., New York, N. Y.

Marler, T. J.—Cleveland, Tenn. Chemist and Sales Manager, Manufacturers Soap & Chemical Co.

Junior

Richmond, Peter—25 Charlesfield St., Providence, R. I. Asst. General Manager and Asst. Purchasing Agent, Crompton Co., West Warwick, R. I.

Stifel, W. Flaccus—Asst. Colorist and Chemist, J. L. Stifel & Sons Co., Main and Fourth Sts., Wheeling, W. Va.

Student

Atkinson, Earl V.—1406 S. Norton Ave., Sylacauga, Ala. Student, Alabama Polytechnic Institute, Auburn, Ala.

Lokur, S. R.—Ahmedabad, India. Student, Lowell Textile Institute, Lowell, Mass.

Stearns, Kenneth L.—41 Grace St., Lowell, Mass. Student, Lowell Textile Institute.

It was voted to give prizes in the amount of fifty dollars, thirty dollars and twenty dollars for the three best papers this year.

It was voted to offer Gustavus J. Esselen Co. one hundred and fifty copies of "Analytical Methods" for fifty dollars.

W. S. Williams and Carl Z. Draves were added to the Year Book Committee.

A motion was made by Dr. Draves as follows: That the Committee, to which the work of preparing a list of products for textile processing is delegated, limit the list to homogeneous substances or mixtures for which the chemical formula or complete qualitative composition, or method of manufacture is given by the seller.

Respectfully submitted,

A. NEWTON GRAVES,
Secretary

Accommodations for Members in Chicago

Although the official headquarters for the A. A. T. C. & C. Convention in Chicago on September 8th and 9th will be at the Congress Hotel, the Committee has obtained the names of the following bureaus to whom inquiry may be made concerning other living accommodations, particularly those members who are going to Chicago with their families and might desire light housekeeping apartments rather than regular hotel accommodations.

Travel Guild, Inc., 180 N. Michigan Ave., Chicago, Illinois. Telephone Franklin 4080.

Visitors & Tourists Bureau, 213 S. Wabash Ave., Chicago, Illinois. Telephone Harrison 9445.

Other information may also be obtained from a renting guide which the Chicago *Herald & Examiner* publishes every week. It is also understood that Chicago Chapters of leading lodges and orders of the country have a list of quarters available for members of these bodies.

If persons are desirous of obtaining further advance information concerning living quarters in Chicago for the Convention, it is suggested that they write to:

A. J. Feit,
c/o E. I. du Pont de Nemours & Co.,
7 S. Dearborn Street, Chicago, Illinois.

AMERICAN
DYESTUFF
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PROFIT AND PROFITEERING

BEING advocates of a fair profit for industrial enterprises, we were particularly interested in a radio address of Hugh S. Johnson, administrator for the National Recovery Act, directed, in part, against profiteering and its evils. The distinction between profiteering and profit being what it is his remarks carried particular weight. One of the purposes of the Act is to enable all to earn a fair profit and, according to the remarks of Administrator Johnson, prevent profiteering. One sentence (quoting him) leaves little doubt in a person's mind regarding the attitude of the administration on this subject.

"The whole thing simmers down to the job of keeping the purchasing power of workers in step with the price and quantity of the things they make."

If wages, prices and production can be kept in their correct proportions to one another industrial ailments can be alleviated to a great extent. Upon these three factors depends the condition of industrial life. If prices are raised out of proportion to the increase of wages, conditions won't be improved as we will be in the same fix as we are now—too many people without enough money to buy the things they need and want. In order to stimulate industrial activity the buying-power of our wage earners must keep pace with any advance in the prices of the consumers' goods. As the cost of the finished goods depends in part upon the price of the raw materials, raising the prices of raw materials must be accompanied by a corresponding increase in wages or we will have profiteering and its accompanying bad effects.

There have been recent price increases and there have also been wage increases but with 12,000,000 people still unemployed in this country and others with greatly or partly reduced incomes any exorbitant price increases will result in additional hardships for many of these people. The only way they can be protected is to raise wages commensurate with prices.

Enlarging further upon this subject we will again quote the administrator.

"This is a deadly serious matter—this danger of runaway prices. There are still about 12,000,000 unemployed in this country, and even those who have jobs are largely on much reduced incomes. Any wild-cat price lifting will have its first bearing directly on the necessities of these unfortunates—their means to keep out hunger, thirst and cold. This administration simply will not stand for that, and we do not expect to have any trouble about it. Our best people understand this is no time to get rich quick. It is the time to pull our country out of a hole. We need every good man on the ropes, and nobody is going to do a thing that makes him a peace-profiteer by taking advantage of the patriotic unselfishness of his fellows."

We have it on better authority than our own that times are improving and that the strain is easing off a bit. There will be opportunities for legitimate profit under the various codes to be adopted by industry but profiteering has no place in this scheme.

SPEED REQUESTED

A MUCH clearer concept of the nature of the industry codes to be drawn up under the terms of the National Recovery Act has been obtained by the textile industry, as a result of statements by President Roosevelt and Administrator Johnson, the formal submission of a code for the cotton textile industry, and information which has become more generally known regarding what various divisions of the textile industry itself are planning to incorporate in their codes.

The Government has made it clear that the first codes submitted should be confined largely to maximum work hours, minimum wages and questions affecting labor. Matters of trade practice and minimum price are of secondary importance, in the eyes of the Administration, and should be made the subject of later additions to initial codes.

The cotton textile industry has done an impressive job in the preparation of its code, which is the first to be submitted to the Government by any industry. This code will undoubtedly serve as a model for other branches of the textile industry, as well it might. Contrary to the opinions held in certain quarters regarding the desirability of taking things easy in the preparation of codes, Mr. Johnson this week specifically called upon industry to hurry up in the submission of its initial codes, to be confined almost entirely to establishing maximum hours of labor and minimum wages.

British Color Standards

In conjunction with the National Physical Laboratory at Teddington, the British Standards Institution is engaged in setting up a standard of exactly defined commercial colors. It is reported that one object of the scheme is to rid British manufacturers of losses caused by foreign fashion dictators, and that, so far as manufacturers of colored fabrics are concerned, a meeting is to be held shortly for the purpose of standardizing about a hundred shades. This move is in accordance with a decision of the Imperial Conference at Ottawa last year, and the standards are likely to be adopted throughout the Empire. In meeting competition the manufacturers will not be limited to the hundred standard colors.

It is expected that slightly different shades will be introduced from season to season, but it is intended that these should be obtained merely by modifying one or other of the standard colors. There are some three thousand shades of color visible to normal eyes, and probably considerably more detectable to the trained observer, so that the standardization of some hundred colors is not so simple a process as it may appear at first sight. On the whole, the standardization process will be welcomed by the industries concerned, but the correspondence columns of the "Morning Post" have already borne testimony to the fact that it will not please everybody. We should welcome expressions of opinion from our readers on this latest step towards standardization.

Mr. George Sheringham, in a letter published last Saturday, expressed the view that no other nation would follow "so imbecile an example." This is what he says about the scheme: "Leaving aside the color blindness bogey, which scientists always drag in whenever color is discussed, for it bears the same relation to color as deafness does to music or lameness does to athletics, it appears that in certain scientific and commercial centres it is thought that color disarmament, so to speak, is the best way of fighting the wicked foreign fashion dictators. These fashion dictators are, as a fact, men with an equipment of real knowledge about color, not only the knowledge gained by peering through spectroscopes, but, in addition to this, knowledge of the psychological and aesthetic value of color. They are using the full range of beautiful dyes and pigments which scientists have given them and us too; fully armed for any warfare. Nevertheless, it is seriously proposed that British trade will benefit by restricting its use of colors to one hundred (with occasional seasonal additions), while its competitors are free to choose from 3,000."

For about ten years Mr. Sheringham has had in his possession a book illustrating 1,431 shades of color, and he has examined a more recent work illustrating far more. All these colors are named and numbered, and both were issued in the United States for the purposes of American trade, so Teddington cannot claim to be launching "the first system of exactly defined commercial colors in the world." If anyone would like to study examples of restricted and unrestricted color in actual use, he suggests that they glance at the posters on the nearest hoarding, where they will see examples of the former governed by mechanical limitations. Then let them visit one of the big silk mercers in London, where they can observe the color activities of the "fashion dictators." Their eyes will not fail to perceive almost infinite variety, much beauty, and thriving trade.—*The Chemical Age.*

Commencement at North Carolina State

Eighty per cent of the graduating class have already been placed in the textile industry and a textile position is available for every member of this year's graduating class, according to State College officials who stated that the requests for Textile graduates this year have exceeded the number of men in the class.

Commencement exercises at North Carolina State College, June 10-12, closed another successful year for the Textile School of that institution, the enrollment having been larger than it has been for several years. Nine States and two foreign countries were represented by students.

Bachelor of Science degrees were conferred upon twenty-two young men who had completed four years of prescribed work in the Textile School, with Master of Science degrees were conferred upon three who had completed a year of graduated work.

The medal awarded annually by the National Association of Cotton Manufacturers to the most proficient Textile student in the graduating class was presented to Dorrys E. Bennett of Greensboro, North Carolina. Mr. Bennett has accepted a position as Assistant Designer at the Roanoke Mills Company, Roanoke Rapids, N. C.

The medal awarded by the Textile Colorist to the senior in Textile Chemistry and Dyeing who presents the best thesis upon this phase of textile work was presented to J. H. Troutman of Statesville, North Carolina.

These medals were presented by Mr. M. R. Harden of Durham, North Carolina, an alumnus of the Textile School who is superintendent of the Erwin Cotton Mills and Secretary of the Eastern Carolina Division of the Southern Textile Association.

New Silk and Rayon Directory Published

The Silk and Rayon Directory & Buyers Guide of Great Britain, 1933, has recently been published by John Heywood, Ltd., Deansgate, Manchester, England. The new edition, which sells for 21/- net, has been revised throughout, and in addition to the usual data a new section gives a complete list of the silk and rayons tariffs of the world.

The book consists of 451 pages, and includes in its contents an alphabetical list of firms in Great Britain handling silk and rayon; trade associations, etc.; rayon producers of the world; trade names, textile assistants, oils, soaps, appliances, etc.; trade names, yarns, fabrics, clothing, etc.; classification in towns of manufacturers, spinners, dyers, agents, engineers, etc., and a classified buyers' guide.

"Color Fast" is Officially Defined

By **WALDON FAWCETT**

SELDOM, if ever, does Federal judicial authority vouchsafe, in a single comprehensive and conclusive expression, a complete definition of the legal construction placed upon the terms or specifications of industry. Rather is it necessary for the layman to arrive at an understanding of the official viewpoint by pyramiding successive rulings and decisions which afford a composite and cumulative appraisal. All of which, by way of emphasizing the contributory significance of a decision on appeal recently announced by the U. S. Commissioner of Patents in a case brought by the Barrett Company of New York.

That the administrative head of the U. S. Patent Office is in position to, in this instance, concern himself with the analysis of designations indicative of color-permanency is due to his incidental responsibility as keeper of the Register of Trade Marks. Admissibility to the roster of certified merchandise-marks depends, for one thing, upon compliance with the prohibition upon mere descriptiveness in technical trade marks. Thus it comes about that the Commissioner, sitting in judgment above the U. S. Examiner of Trade Marks, is continually called upon to determine whether a word, name or phrase, besought in monopoly by a single interest, carries so much of fundamental information regarding a commodity or its qualities as to, in equity, require conservation for the use of science or industry at large.

Color-fastness, by imputation, the gauge of controversy in the latest contest in this quarter, is by no means a new issue in the tribunals at the Patent Office. Time and again, the Governmental censors have been called upon to fix the location of the hair-line dividing the suggestion of color endurance from the downright declaration of color integrity. The Barrett case is an addition to all that has gone before notably because it has brought into the reckoning the question of what distinction, if any, is warranted as between trade usage and popular usage of color specifications.

"Ever-Fast," applied as a trade mark to a fabric of fibrous base treated with waterproofing material, was the notation for which the Barrett Company unsuccessfully sought registration. The plea of the claimant was that the term was not "merely" descriptive in the sense that the law excludes terms that are solely and narrowly indicative or explanatory of color. Furthermore, the applicant contended that the word "fast" has not been used in the trade in connection with the color of the goods.

The Patent Commissioner would not be persuaded that there was anything of the fanciful in a compound of "fast" applied to articles of commerce marketed in different colors. He remarked that the word "fast" is widely used in connection with materials that are colored to indicate the permanency of the color and he stated his belief that the presence of the "Ever-Fast" notation on the Barrett goods would mean that the colors of the goods are permanent and will not fade unduly under weather conditions.

Nor was the arbiter at the Department of Commerce any the more willing to accept the extenuation the argument that the community is not trade-conscious of "fast" as a synonym of color tenacity. He recalled a decision in the Court of Appeals which held that evidence that several traders had not heard of the use of a mark by others does not prove in the least that it is not descriptive. Summing up in decision that "Ever-Fast" was not entitled to admission, the Commissioner declared that purchases would understand the notation was descriptive of the permanency of the color of the goods.

While this "Ever-Fast" case was on appeal there were marshalled, in support of the respective contentions, principles established in a number of other test cases involving the status of terms reminiscent of color. It was revealed that not only is it impossible to establish trade mark rights in color itself but the names of colors and all words descriptive of colors or their qualities have repeatedly been rejected as ineligible to certification for exclusive use. Even under the common law a term descriptive of color-fastness or other inherent virtues cannot be lifted out of the vocabulary of industry and commerce by an appropriator. Unless a color notation is used by a competitor in imitative combination one trader has no right to an injunction restraining use of the designations by a rival.

Looking for precedents for the veto of "Ever-Fast," it was discovered that, years ago, registration was denied to the caption "Eddie's Everlasting" as a trade mark for liquid dyes on the score of descriptiveness. More than a

decade ago "Ever-Fast" was denied a certificate of registration for use on linen, cotton and mixed piece goods. In the same spirit, a canning concern failed in its ambition to fence off for its private use the term "Evergreen." "Orange Rich" was turned away at the Trade Mark Division and the code in force was further exemplified by the ruling adverse to "Resis-tacid." "Tub-Test" met the same fate when nominated as a nickname for overalls and work coats and, in another environment, a rejection was drawn by "Stabrite" and by "Dyanshine."

Traders, seeking to capitalize as trade marks proclamations of color properties or color characteristics, have, on occasion, argued at Washington that reservations should not be placed by the authorities upon any specific terms since the color-producing or color-using industries have not agreed upon universally-accepted or standard terms to denote fast colors. It has even been represented that such has been the ambiguous use of the term "fast color" that a portion of the public has lost confidence or ceased to attribute exact, dependable significance to the term. Much was made of this point at the time that the Shirting Fabrics Association and other groups were most active in behalf of a standard vocabulary covering color resources.

Several of the interests which have sought to persuade the Federal authorities to enroll trade mark names indicative of color attributes such as fastness have undertaken to vindicate their candidates as of a parity with "Red Label," "Blue Ribbon" and similar indulgences in color selection. The Patent Office tribunals and the Federal courts have steadfastly refused to accept this view. Marks built upon color placement in the article identified rather than upon quality inherent in the color material and processing are allowed on the theory that the consuming public has, by habit, become accustomed to take note of the use in industry of the sign language of color. Thus, the Commissioner of Patents, who allowed the entry of "Blue End" in the face of the prior use of "Red End" on the same class of goods, remarked "It is so common to color various goods that purchasers are quite accustomed to note the contrasting colors employed." He added that the distinctive color adopted by one brander would be considered by purchasers as in sharp contrast to the color adopted by his competitor, if both lines of color-marked goods appeared in the same markets.

Solicitous as are the Federal censors to exclude from the Trade Mark Register the terms that are merely descriptive, they are equally vigilant in the opposite extreme, —disbarment of the deceptive terms. In not a few instances the two principles of denial are invoked in conjunction. Thus, authority at the Patent Office will hold that if a given word be not descriptive, then is it deceptive and, of course, no less taboo on the second count than on the first. There is, however, one avenue of escape open to the designation that, at first glance might be indicted as deceptive. Salvation is possible if it may be demonstrated that a suggestive term is so obviously extravagant, so gross an exaggeration of fact, that no person of ordinary intelligence could be deceived. This indulgence to the term that is fantastic in its boastfulness accounts for the acceptance of terms such as "Holeproof" and "Wearever." Patently, though, this technique is of little avail in respect to characteristics so subtle as color fastness.

One of the interesting arguments put forward by Counsel in the current case of The Barrett Company was based on the premise that, even in respect to color the term "Fast" has a significance in the dyestuffs industry different from the meaning in other environment. This theory was put forward in connection with the disclosure that there have been several registrations of the term under the alternative trade mark statue,—that is to say the Act of 1920.

The mere circumstance that registration of these marks built on "fast" has been under the later, or supplementary, trade mark law, instead of under the basic Act of 1905, would, of itself impute a descriptive meaning,—descriptiveness being condoned by the Act of 1920 as it is not by the Act of 1905. Mr. Forbes Silsby addressed himself to this circumstantial evidence.

He called attention to the fact that most of the accepted registrations under substitute system are for the mark "Ever-Fast" as applied to dyestuffs or to textile materials "with respect to which the word 'fast' has the meaning of not liable to fade or lasting, as fast colors, and is commonly used in this connection to describe the dyes or the colored goods themselves." He insisted that the dye and textile cases differ from other cases involving colored merchandise, where "fast" is not an adjective commonly used to describe the commodity. Counsel contended that the essential test was whether "Ever-Fast" is a part of the English language in ordinary use to describe the products upon which it is employed, and what is the effect upon dealers and purchasers? Answering his his own question, he reasoned that if a trade does not ordinarily employ the term "fast" with reference to color, members of that trade would not be expected to analyze the term to find in it a description of kind or quality. For all the force of the presentation it failed to temper the rejection of the application.

Azo Dyestuffs

German Patent No. 461,648 (31/*V*/'28)—*I. G. Farben-Ind. A.-G.*—A rather simple patent. It covers only the use of 2-naphthol-6-carbonic acid as a second component, to which is coupled the diazo-compound of any desired amine. The point involved seems to be that the 2-6-compound is now easily available according to German Patent No. 436,524, and that its coupling products are more easily soluble, and very much greater in strength, than are the coupling products obtained from the more common 2-naphthol-3-carbonic acid (the basis of Naphthol AS).

Four examples are given, all simple couplings; also a table covering 15 other couplings, with notes upon the characteristics of the products.

EXPRESS WARRANTY OF WATER FILTERING PLANT AS WARRANTY OF FITNESS FOR USE BY TEXTILE MANUFACTURER

By **Leslie Childs**

AS A general proposition of law, when a textile manufacturer buys machinery under an express warranty, he will be confined to the terms of the warranty in claiming damages for failure of the equipment to perform. And an express warranty of the equipment, in itself, may fall far short of creating an implied warranty of fitness for the manufacturer's purpose.

By the same token, if the equipment complies with the express warranty, the manufacturer may be denied the right to recover special damages that may result to his product from its use. The application of this rule, and the possible danger to a textile manufacturer in overlooking it when machinery is being purchased, is illustrated in a striking manner in the following case.

Cotton Manufacturer Buys Water Filtering Plant

In this case, a company engaged in manufacturing cotton linters purchased a water filtering plant to be used in its business. The contract was in writing and warranted, among other things, that the plant would filter a specified amount of water at the specified flow; that the water when filtered would be "clear, bright and practically free from turbidity and suspended matter"; that the water would "not have a color in excess of 2 measured in accordance with the Standards as set forth by the American Public Health Association." And that the vendor would make good at its expense any defects due to faulty design, workmanship, or materials within a period of one year.

The plant was installed upon the premises of the vendee, manufacturing company, and following its use the latter claimed that thousands of pounds of cotton manufactured by it were off color. The vendee thereupon brought suit on the contract against the vendor for the damages suffered. The vendor countered by filing suit for the balance of the purchase price of the filtering plant.

Now at this point it may be noted that the filtering plant was sold under an express warranty, as has been outlined, and that the terms of this warranty are silent in respect to knowledge of the vendor of the vendee's requirements; and no mention whatever is made of any warranty of fitness for the vendee's business.

However, upon the trial of the case, the judge instructed the jury that this express warranty did not exclude the vendee from claiming damages under other warranties express or implied, and permitted evidence of special damages alleged to have resulted from the use of the plant. The trial thereupon resulted in a judgment for the vendee in the sum of $32,784.79. The vendor appealed, and the higher court in reviewing the record and in reversing the judgment, in part, said:

The Language of the Court

"The vendor objected, at the trial, to the admission of evidence of special damages sustained by the vendee, on the ground that the written contract defined and limited the vendor's liability for any breach by it so as to exclude such special damages. No mention is made in the guaranty that the filtration plant was designed with any knowledge of the requirements of the manufacturing processes of the vendee, and no such information was conveyed to the vendor.

"To the extent that the warranty may be said to have been a warranty of fitness to deliver water of a certain color, such warranty would exclude any implied warranty of fitness; for example, that the water so purified was to be fit for the purpose of processing and purifying raw cotton. There is nothing in the express warranty to the effect that the water to be delivered by the plant would be fit for such purpose. * * * We think the court erred in allowing the jury to consider warranties that were not expressed in the contract. * * *

"It follows from what has already been said that the trial court erred in admitting evidence of special damages, consisting of damages to the manufactured cotton and of increase in production, manufacturing, and overhead costs and expenses. The authorities overwhelmingly establish the doctrine that, where the parties have set out in the written contract the warranties agreed upon and have provided for a remedy in case of a breach of warranty, the remedy thus provided is exclusive. * * * we are of the opinion that the trial judge was in error in allowing special damages to be proved and recovered by the vendee. Judgment reversed, with directions for a new trial in the consolidated suits." (60 F.2d.529)

Conclusion

The foregoing case was carefully reasoned by the court, and the holding announced is unquestionably in accord with the great weight of authority on the point involved. This authority taking the position that where machinery is expressly warranted, the buyer will be limited by the terms of such warranty in claiming damages for an alleged breach thereof. And, in the absence of supporting circumstances, the fact that there is an express warranty will exclude the implication that there was also an implied warranty of fitness.

In the light of this case, it is perfectly obvious that if a textile manufacturer desires to hold a seller of machinery to a warranty of fitness of the equipment for the purpose purchased, the prudent thing to do is to have such warranty set out in the contract. For, as we have seen, a contractual warranty that merely covers the material, workmanship, design, and output of machinery may fall short of warranting its fitness for the buyer's purposes. A nice point this for both buyers and sellers of textile machinery to have in mind when contracts of sale are being entered into, to the end that they may be drawn so as to guard against after dispute on this subject.

GREAT POSSIBILITIES IN MODERN WASHING ASSISTANTS

SO OFTEN in the past have false claims been made for the many proprietary scouring assistants on the market that people have become skeptical and in some cases openly antagonistic towards these products and refuse to have anything to do with them.

To ignore them is, however, rather a narrow-minded policy for even if they do not fulfill all that is claimed for them, many of the latest products are a definite step forward and will have to be recognized eventually as supplying a definite want. The progressive manufacturer's policy of telling the world what his product is made of is another step in the right direction and should do much to dispel the feeling in the mind of the buyer that he is getting a "pig in a poke."

One of the greatest points of superiority over soap is that many of these washing products are free or nearly free from soda. Now all soap contains soda and exactly how far this soda is free to act in its own way in solution and how far it is modified by the fatty acids present is not known exactly even today. Thus wool substance has a slight decomposing action on soap apart from any other agent. It has been shown (Journal Tex. Inst. 1922. 13. 127) that in the scouring bath alkali is absorbed by wool leaving free fatty acid accumulating gradually. The point in mentioning this here is to make it clear that soap is very easily split up and when we get soap and wool or silk together in a bath, we are dealing with two unknowns at the same time, a tricky business.

Now the great feature about many of the new products is that they are very stable to all influences and so that a little more lime or a little more acid makes no real difference to their action. It is useful to know which of the many products one meets with is most stable and this knowledge is more valuable to the practical man than the chemical formula. For instance, it is well worth while to boil every sample which comes in with (1) acetic acid, (2) sulfuric acid, and (3) calcium chloride and allow the test to stand. Any tendency to coagulation is quickly detected and a product which will stand up to all three can be safely used for all ordinary processes in the mill.

At the present time the great objection to the more universal application of these stable soaps is the price and here it is as well to leave the discussion and pass on to the practical side of the subject.

These products may conveniently be used in small quantities for oil stain-removing and some of them are excellent for this purpose.

The affected place should first be cleansed of loose grease and dirt with carbon tetrachloride or similar non-aqueous fat solvent. A treatment of this kind removes all the oil but it does not always take away quite all the dirt; there is usually a dark patch left. It is for clearing up this last portion that the proprietary products can be applied.

As a general rule they may be used warm in solution and the sullied part is merely worked about in the liquor until it becomes something like clean. A similar treatment in soap would in all probability remove some of the color.

If it is known definitely that the fabric is dyed with acid colors, still more thorough precautions can be taken against bleeding, namely, the solution can be rendered acid with acetic and used as before. It seems as if the acid holds the dye on the fiber, for none comes off and bleeding is absolutely at a minimum. Those who have tried soap before will be surprised how clean silk and wool remain in such a solution. Yet the lathering and cleansing power is not impaired. There is a definite advantage in washing wool and silk in slightly acid solution, damage is less.* In fact acid scouring may become possible when the new products are cheaper.

* The iso-electric points of wool and silk (i.e., the hydrogen ion concentration where damage is least), are well on the acid side of neutrality—wool pH 4, silk fibroin pH 3.8.

IDENTIFYING BASIC DYE MORDANTS

FROM the Japanese Journal of the Society of Chemical Industry comes the following method of distinguishing between the tannin-antimony and the katanol mordant on cotton and viscose rayon dyed with basic colors.

It is claimed to be very simple and to give accurate results in all cases.

The principle depends upon the following four points: (1) most basic dyes when treated with alkali form color bases that are insoluble or nearly so, (2) under these conditions the tannic acid dissolves and is easily oxidized by air to reddish brown compounds, (3) katanol O is dissolved without coloration, and (4) the dissolved katanol O can be precipitated by acid.

To make the test about 0.2 gram of the unknown dyeing is shaken in a test tube for a few minutes with about 10 c.c. of 4 to 6 per cent caustic soda solution. With any tannin-antimony dyeing there will be a reddish brown color due to oxidation of the dissolved tannin, and the effect is usually easily distinguishable from any slight color due to bleeding out of color base. If it is a katanol dyeing the extract will be colorless.

As a confirmatory procedure for tannin, divide the extract. Keep half without further agitation and shake the other half vigorously. If tannin the latter will show a darker red-brown color than the other half of the solution. If katanol there will be no change.

To confirm the presence of katanol after boiling for one minute in the caustic the sample is removed and the solution filtered if necessary. To the filtrate is added a slight excess of concentrated hydrochloric acid. If the mordant was katanol there will be a colored precipitate due to the formation of a color lake between precipitated katanol mordant and the dissolved dye. There is no such precipitate with tannin.

The test is reliable for quantities of mordant equal to 0.5% of the weight of the goods, and with care there is no uncertainty down to 0.2% of either mordant.

Technical Notes From Foreign Sources

After-chroming Azo Dyestuffs

German Patent No. 462,185 (14/VI/'28)—*Gesells. f. chem. Ind. in Basel.*—An azo dyestuff whose first component is a nitrated 1-amino-2-naphthol-4-sulfonic acid, and whose second component is a naphthol or derivative thereof, is reduced. If during the reduction there is present an organic hydroxyl compound, of the classes typified by glucose or cane sugar, glycerol or glycol, tannin or gallic acid, or sulfite liquor, the yield of dyestuff is higher, and the desirable properties of the products are retained.

French Patent No. 579,510 covers the simple reduction of the nitro-dyestuffs; the present patent is an improvement of the conditions of the reduction.

The products are more easily soluble in hard water, and dissolve more easily than do the earlier products. Dyed upon wool, and after-chromed, they give blacks, deep and lustrous, completely fast to fulling and potting, and of very good fastness to light. Two examples are given.

Azo Dyestuffs Containing Chromium

Germant Patent No. 468,576 (1/XI/'28)—*I. G. Farben-Ind. A.-G.*—The single product covered by this patent is formed by acting upon the azo dyestuff produced by coupling diazotized metanilic acid to salicylic acid. Of this dyestuff, 700 parts are warmed for some hours with 3,000 parts of chromium formate solution containing 196 parts of Cr_2O_3; then the whole is evaporated to dryness.

The product dyes wool a clear, greenish-yellow of excellent fastness to all agencies. It is claimed to be suitable also for cotton printing and batiks.

Acid Azo Dyestuffs Containing Chromium

German Patent No. 467,861 (3/XI/'28) (*additional to G. P. No.* 411,384)—*Gesells. f. chem. Ind. in Basel.*—The original patent and a supplement cover the preparation of mordant dyestuffs by coupling o-hydroxy-diazo components to hydroxy - naphthalene - polysulfonamides. The present patent modifies such products by introducing chromium into the molecule.

E.g., 4-chlor-2-amino-1-phenol is diazotized and coupled to 1-naphthol-3-8-disulfonamide. Of this product, 45.5 parts are dissolved in 800 parts of boiling water, the solution mixed with a chromium formate solution containing 10 parts of Cr_2O_3, and the whole refluxed for several hours. The solution is partly evaporated, and the new product salted out.

The dyestuff in this case is a dark powder, easily soluble in water with a blue-violet color, and dyeing wool from an acid bath in pure red-blue tones, very level and very fast. Other examples (3 in all) give a pure blue and a pure violet.

o-Hydroxy-azo Dyestuffs

Germant Patent No. 468,483 (13/XI/'28)—*Gesells. f. chem. Ind. in Basel.*—Dyestuffs produced by nitrating the diazo-compound of 1-amino-2-naphthol-4-sulfonic acid, and coupling this with alpha or beta naphthol, are known, and also the products obtained by cautious reduction of the nitro-group in these two dyestuffs. The products are sparingly soluble in cold water, and rather sensitive to free mineral acid in the dyebath.

The present procedure covers the further modification of these reduced products by reacting them with formaldehyde and sodium bisulfite, formaldehyde-sulfurous acid, or compounds which can liberate such agents.

E.g., 450 parts of the reduced dyestuff from beta-naphthol are dissolved in a solution of 45 parts of caustic soda in 8,000 parts of water at 50° C., and a mixture of 100 parts of 35% formaldehyde solution and 285 parts of 40% sodium bisulfite liquor stirred in. The mixture is stirred for some hours, when acetic acid (10%) is stirred in until the deep blue color of the solution changes to violet, when the product is salted out. When dry, it forms a black powder, soluble in water and a violet-brown, in dilute caustic soda with a black, and in concentrated sulfuric acid with a blue color.

The products, beside being easily soluble, dye level. When after-chromed, the dyeings are very fast.

Loss of Luster of Acetate Silk in Hot Baths

Dr. Wolfgang Stahl—Kunst-Seide 14, 153 (1932).—The loss of luster of acetate silk when handled in really hot baths has been regarded as the most serious difficulty in working with this material, whether for the dyer, who has to dye it, or the consumer, who has to launder it. Naturally, more so than if it had been a desirable feature of the fiber, and difficult to attain, such a property has given rise to various explanations, and also to more than one definite theory. The explanation which has gained the firmest foothold is that which accounts for the loss of luster by a partial or complete hydrolysis of the cellulose acetate, it being supposed that a lower acetyl content, in the case of partial hydrolysis, must possess a different and weaker sort of luster, or that deacetylation might produce some alteration of the physical characteristics of the fiber, even though the lower acetylated fiber, if so produced, might possess a high luster—etc. But this facile "explanation" (and it appears now that it has been only that) has been questioned of late to an increasing degree. According to some researches carried out at the Forschungs-Institut fuer Textil-Industrie in Dresden, hydrolysis has nothing whatever to do with the loss of luster.

Up to 1929, no real work upon the connection between hydrolysis and loss of luster had been published; the task, therefore, was somewhat simpler, since there were no preconceived conclusions to be checked up; the whole problem could be attacked with an open mind.

It is true that a number of investigations of the chemical degradation of cellulose acetate in alkaline and in acid baths have been carried out. This problem has been studied almost exhaustively by Haller and Ruperti, but their work contains only a few incidental remarks upon the alteration of the luster of the fibers treated, and are such that no conclusions can be drawn from them in that connection.

The first step in the present study consisted in the treatment of a large number of samples of acetate silk in baths containing different percentages of alkalies and of acids, at different temperatures, and then in determination of the degree of hydrolysis and of the loss of luster of the treated samples. The astounding observation was made, that the luster of the acetate silk fibers, which had been more or less hydrolyzed in hot alkaline baths, remained very little altered, while the luster of fibers treated with hot distilled water, or very dilute alkalies or acids, lost their luster entirely, though no detectable hydrolysis had taken place. The results could be summarized as follows: "Loss of luster of acetate silk fiber begins at temperatures of about 70° C., and increases as the temperature rises beyond this point. The loss of luster is reasonably slight or unnoticeable after a treatment in alkaline baths corresponding to a concentration of N/10 to N/5 of NaOH; the loss of luster increases as the alkali content decreases. Strong loss of luster of the fiber takes place on treatment with hot water alone, or with dilute or concentrated acids. Any connection between loss of luster and degree of hydrolysis could not be observed."

Evidently, in the matting effect of hot baths, considered, at least, purely from the viewpoint of loss of luster, no chemical breaking down takes place. This point was checked up carefully. E.g., acetate silk fiber was boiled under reflux with distilled water until complete loss of luster had taken place; yet no acetic acid could be detected in the water. Further, such a delustered acetate silk has precisely the same response toward pH indicators as before. Careful quantitative analysis showed the lustrous and delustered fibers to have the same percentages of C, H, and O. The viscosity of a lustrous and of a delustered acetate mass in acetone was exactly the same.

In other words, loss of luster has no necessary connection at all with chemical degradation of the acetate. Careful microscopic study, however, has thrown much light upon the problem.

When an acetate fiber which has been delustered by the action, say, of boiling water, is examined under the microscope, the fiber will be found to be full of minute cavities—cracks, bubbles, etc., not only upon the surface, but throughout the substance of the whole fiber. These cracks and cavities evidently originate thus; when the fiber is immersed in water, a certain amount of the water is absorbed as a swelling-agent, and the fiber increases in diameter and weight. As the water of the bath is heated, the acetate substance undergoes a certain softening (we know this as a characteristic plasticity toward tension or pressure, in the ordinary fiber). This softening, which must be regarded as a loosening-up of the cohesion between the ultimate particles (micelles, or by whatever name they may be called), becomes so pronounced between 70° and 100° C., that the gases dissolved in the water, and the bubbles of vapor formed by the coming of the water to the boil, are able to inflate the soft fiber locally, to swell it up where they occur, and even to rupture it and escape, leaving fissures in the surface, or, if still entrapped, remaining as cavities within the fiber. Hollows and crevices remain, of course, in the fiber as the temperature of the bath later sinks; the luster of the fiber, as a whole, is now that produced by greatly interrupted and strongly irregular reflection from the manifold adjacent new surfaces lying irregularly in reference to each other, instead of being the uniform and characteristic luster derived from a fairly smooth cylindrical or ribbon-like band: the luster as ordinarily understood is gone—the difference may be compared to the luster of a sheet of glass as compared to what is the case when that sheet of glass is crushed to powder.

The extent of the softening process, and so the degree of loss of luster, is dependent upon the content of the fiber in the swelling-agent. If, e.g., a salt solution, which does not greatly swell acetate silk, is used, the fiber cannot soften to such an extent, and delustering is correspondingly less. Nitro-silk, which does not swell greatly, is correspondingly stable as to its luster.

The whole process seems to differ from that which takes place in the case of cellulose. The latter fiber swells to a greater degree in water than does acetate silk; the latter, therefore, possesses greater tensile strength when wet (we are speaking of conditions in the cold). But cellulose fibers do not soften at higher temperatures, as do acetate silk fibers. The conduct of the two materials toward salt solutions is also different; cellulose swells more strongly, acetate silk less so, and its behavior is peculiar; a kind of osmosis takes place, the water alone penetrating into the interior of the fiber, and not the dissolved salt.

The present study also proceeded in a third direction; that of clearing up the phenomenon of loss of luster under conditions met with in practice. Quite a number of patents have been granted, dealing with these problems, and they may be classified as follows:—

a—procedures which expressly produce a loss of luster for some special purpose.

b—procedures which propose ways of avoiding loss of luster,

a—by lowering the temperature of the bath,

b—by addition of protective substances to the bath, to enable a higher temperature to be used,

c—by altering the properties of the acetate silk itself.

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TECHNICAL SERVICE

(Continued from page 409)

in the development of new outlets for color, the service laboratory assumes the proportions of a large consultant organization. Of recent years the demands made are more and more technical. Microscopic photographs of emulsions of the new detergents and finishing compounds recently developed, are necessary for true evaluation of the products. Spectrophotometric methods of color analysis as a control have become the rule rather than the exception. In short, it is hard to conceive that the technical staff of the service laboratory of today would not be capable of suggesting a method for the solution of any problem concerning the use of dyestuffs. In many cases the return on the investment is not commensurate with the expenditure of time and effort, but the fact remains that the personnel, equipment and above all, the desire for cooperation are there and may be had for the asking.

This brief picture of the activities of a technical service laboratory is not intended to convey the thought that the only problems encountered in the textile industry are to be found in such a laboratory. As was pointed out at the beginning of this talk, you textile men have your own problems as you know too well. It is equally true that in all associated industries, and in fact in industry generally, problems just as acute are constantly present. A progressive spirit of co-operation, based on a more thorough understanding of associated lines of endeavor, can only resolve into mutually beneficial results. Let us not destroy the heritage of our education in our chosen profession by narrowing our outlook to within the limits of our own sphere of activity, but cultivate a broader view by trying to understand and appreciate our fellow scientists, whose outlook without our help may become just as narrow, and thus retard progress.

RAYON DYEING AND FINISHING

(Continued from page 412)

(1) A suitable difference in refractive index must exist between the rayon and the delusterant.

(2) The average particle size of the delusterant must be as near as possible to the optimum size for efficient reflection.

(3) The percentage of the delusterant necessary to produce a desired effect will depend on the particle size and on the refractive index of the delusterant; also on the specular reflecting power of the rayon surface. (It should be borne in mind that subjective gloss is a function of the contrast value between the diffusely reflected and specularly reflected light.)

The first internal delusterant of any importance to be used was mineral oil. This material was incorporated in the viscose solution as an emulsion prior to spinning. During the spinning operation the globules of the oil were somewhat drawn out, with their long axis always parallel to the axis of the fiber. The particle size was so large and the index of refraction so nearly that of the rayon that mineral oil was able to give only a semi-delustered effect. It is still in use for this purpose, however.

In the nitrocellulose process for making rayon the oil goes into solution in the alcohol-ether solvent and precipitates in the fiber on spinning in such a fine state of subdivision that it gives even less delustering effect than it does in viscose. As cellulose acetate has an index of refraction that practically matches that of miner oil this material has never been used as a delusterant for acetate yarn.

When attempts are made to increase the delustering effect of oil by incorporating larger quantities in the fiber, the tensile of the yarn becomes seriously impaired, hence any endeavor in this direction is not practical. When it was discovered that pigments had the power to deluster, it was soon realized that a means was at hand to carry delustering to completion. On account of the relatively high index of refraction of most pigments, together with their nearly ideal particle size, a comparatively small amount of pigment will give complete delustering. For this reason, the tensile is not affected as it would be in the case of mineral oils.

In addition to the optical properties of the pigment or delusterant, the chemical nature of the material must be taken into consideration. The delustering material incorporated in the fiber must be inert to all the baths, acid or alkaline or of any other nature that the yarn must pass through during its manufacture, and also remain unaffected by any subsequent treatment required in normal processing of the fabric.

Titanium dioxide has the highest refractive index of any pigment or pigment-like substance. Its particle size is slightly less than .40 micron. Chemically it is extremely inert. Hence it is the ideal delusterant and is the one that is most commonly used today for internal delustering.

Certain pertinent questions have constantly arisen in regard to some of the properties of internally delustered rayon. For instance, it is often asked whether repeated washings will remove the pigment delusterant. If the pigment is completely water insoluble and chemically inert to the extent of titanium dioxide, then the answer is that no amount of washing can remove the slightest trace of the delustering agent. Titanium dioxide and other practical pigments have a particle size that is collosal in comparison with the size of the pore openings in the fiber. Furthermore, the particle is unable to move about since it is firmly imbedded in the cellulosic structure which in itself is not a liquid and cannot flow except under high tension. The particle being unable to move and furthermore being too large to pass through the pore spaces in the fiber, it becomes obvious that it cannot be removed except by destroying the fiber.

Perhaps the next most frequent question is: Why does internally delustered rayon become lustrous when dyed

black or with dark shades? The answer follows from what has preceded. Jones has stated that subjective gloss depends on the contrast value between the specular and diffusely reflected light. If the intensity of the specularly reflected light remains constant while the intensity of the diffusely reflected light is reduced, then the subjective gloss must increase. This is exactly what happens when dark shades are applied to internally delustered rayon. The dye does nothing to the surface of the fiber and therefore does not materially affect the intensity of the specular reflection. On the other hand, the light that penetrates the thread is either partly or completely absorbed by the dye and so is prevented from being diffusely reflected from the pigment particles. Looking at it in another way, if the particles are covered up by the dye they are no longer able to function by diffusing the light and so producng the effect of delustering. If the dye is removed from such a yarn or fabric the delustered appearance will be regained. If the fibers are then examined under a microscope, the pigment particles will be found intact and unchanged.

References

[1]"The Measurement of Gloss," By A. H. Pfund, J. O. S. A. Vol. 20, Jan. 1930.

[2]"The Gloss Characteristics of Photographic Papers," By L. A. Jones, J. O. S. A. and R. S. I. Vol. VI, March, 1922.

[3]Trans. Illuminating Engineering Soc. Vol. 10, P. 353. 379, and 388, 1915.

[4]J. O. S. A. P. 213. May, 1921.

RAYON PRODUCERS MEET TO ORGANIZE

At a meeting held recently a definite decision was finally reached by the rayon yarn producing companies to form a trade association to operate under the national industrial recovery act.

The proposal that the yarn producers band themselves into a separate association for operation under the national recovery act and elect an executive secretary was made by an investigating committee that had formerly been appointed, which reported to the general meeting of producers on Thursday.

Though discussion which followed the report included such matters as maximum hours and minimum wage rates, the effort was to defer such matters and to concentrate on forming the organization. It was suggested that the committee be allowed to prepare by-laws for the group.

Temporary officers were elected with Samuel A. Salvage, president of the Viscose Co., president, and E. R. Van Vliet, treasurer of Tubize Chatillon Corp., secretary. Other meetings will be held shortly.

TECHNICAL NOTES FROM FOREIGN SOURCES

(Continued from page 432)

c—procedures for regenerating the luster lost in hot processing.

The proposals involved in the patents are so numerous and many-sided, that a practical worker would find serious difficulty in selecting any one in patricular for consideration. It would appear that the most simple solution of the problem would be, for the manufacturer of the acetate fiber to produce a fiber which will not lose its luster in hot baths. The author does not advance this suggestion in any naively jesting manner, but seriously, though it seems at first to be a jest; but he goes on to say that the new nitrate-acetate silk, Aceta, does fulfill this condition, without losing the character of an essentially acetate-silk fiber, and without simply replacing the one difficulty, of loss of luster in hot baths, by other difficulties, different but equally serious.

When working with common acetate silk, however, at least the condition of working below 70° C. will entirely obviate the trouble. Some processes, though, encounter difficulties below that temperature; e.g., in the degumming of natural silk-acetate silk mixed weaves, the desired result cannot be attained below 70° C. Addition of various substances proposed, to force the desired reaction to take place below 70°, usually involves danger of damage of some sort to either the natural or the acetate silk. The other most evident possibility, of protecting the acetate silk from matting, though worked at a high temperature, by use of some salt solution instead of water, is of more promise. If a slight loss of luster is allowable, or desirable for purposes of contrast in a mixed weave, the amount of such a salt in the bath may be very small indeed. And, finally, the third possibility, c, is in some cases also of great promise. With a suitable agent for re-lustering the matted acetate silk, one could proceed, even quite recklessly, with hot-bath treatments, without any regard to the temporary loss of luster of the acetate silk, since it can in some cases be restored to as high a degree as existed before loss.

It should be noted, however, that the restoring of the luster lost may impart a somewhat different character of luster, unless the agent used is one which possesses about the same refractive index as the acetate mass, and can be so applied as to fill in smoothly the surface-fissures. Even then, nothing can fill in the "blow-holes" within the substance of the fiber, and not communicating with the surface. But such considerations as these are of only scientific interest, not practical, as the consumer will never notice anything, except that the material has a good luster.

Cuts of two photo-micrographs, and one of some graphs, illustrate the paper.

New Patents

(*Abstracted by S. O. C. M. A.*)

Azo Dyes from Orthodichlorobenzene Derivatives. (Direct-developed type, produced by coupling diazo components into hydroxy aromatic carboxylic acid arylides derived from 3.4-dichloro-anilines and such acids, particularly 2.3-hydroxy-naphthoic acid; dyed natural and synthetic fibers clear, bright, fast shades, the color depending on particular diazo component employed.) Ernest F. Grether, of Midland, Mich., assignor to the Dow Chemical Co., of Midland, Mich., No. 1,907,793, May 9, 1933.

Production of Color Lakes. (Very fast to light, comprising, in combination, a tetra-alkylated-diamino-benzhydrol and complex acid containing at least one of the elements of molybdenum and tungsten.) Heinrich Roth and Bodo Zschimmer, of Ludwigshafen-on-the-Rhine, Ger., assignors to General Aniline Wks., Inc., of N. Y., N. Y., No. 1,907,879, May 9, 1933.

Dye of the Naphtho-phenazine Series and Process of Making it. (Relates more particularly to new iso-rosindulines suitable for dyeing cotton and acetyl silk and new rosinduline compounds suitable for dyeing silk, cotton, acetyl silk and wool; yield blue to violet shades.) Otto Allemann, of Wilmington, Del., assignor to E. I. duPont deNemours & Co., of Wilmington, Del., No. 1,908,099. May 9, 1933.

Azo Dye and Process of Making Same. (Relates to new yellow to orange to brown disazo dyes for cotton, wool, silk, rayon, viscose, etc., of exceptionally high fastness to washing and light.) Henry Jordan, of Wilmington, Del., assignor to E. I. duPont deNemours & Co., of Wilmington, Del., No. 1,908,154, May 9, 1933.

Azo Dyestuffs Containing Chromium and Process of Making Same. (Dye the fiber yellow to orange to red to violet to blue to green to black tints.) Fritz Straub and Hans Mayer of Basel, Switzerland, assignors to the Firm of Society of Chemical Industry in Basle, of Basel, Switzerland, No. 1,908,571, May 9, 1933.

New Vat Dyestuffs of the Dibenzanthrone Series. (Dye cotton grey to black shades of excellent fastness. A continuation in part of copending application Serial No. 267,478, filed April 4, 1925.) Max Albert Kunz, of Mannheim, and Karl Koeberle, of Ludwigshafen-on-the-Rhine, Ger., assignors to General Aniline Wks., Inc., of N. Y., N. Y., No. 1,908,904, May 16, 1933.

Black Sulphur Color and Process of Making the Same. (Improvements in the process of manufacturing a black dye from nitrophenol compounds by fusing the latter with polysulphides. A continuation in part of application Serial No. 84,680, filed Jan. 29, 1926.) George Barnhart, of Salem, N. J., assignor to E. I. duPont deNemours & Co., of Wilmington, Del., No. 1,909,162, May 16, 1933.

Printing Colors and Processes of Preparing Them. (From a dyestuff of the anthraquinone series containing a product obtainable by condensing a urea with an aliphatic aldehyde ammonia compound.)) Max Paquin, of Frankfort-on-the-Main, Ger., assignor to General Aniline Wks., Inc., of N. Y., N. Y., No. 1,909,221, May 16, 1933.

Dyestuff and Process for Preparing Same. (Specifically, the synthesis of dyestuffs formed from derivatives of benzanthrone containing nuclear nitrogen.) Alexander J. Wuertz, of Wilmington, Del., assignor to E. I. duPont deNemours & Co., of Wilmington, Del., No. 1,909,385, May 16, 1933.

Vat Dyestuffs of the Azole Series and Process of Making Them. (New vat dyestuffs derived from 1.9-thiazole-anthrone-2-carboxylic acid or its derivatives; dye cotton clear lemon shades of good fastness.) Filip Kacer, of Mannheim, Fritz Baumann, of Leverkusen, and Artur Krause, of Ludwigshafen-on-the-Rhine, Ger., assignors to General Aniline Wks., Inc., of N. Y., N. Y., No. 1,909,684, May 16, 1933.

Vat Dyestuffs. (Dyeing cotton in a single operation grey to black shades of excellent fastness, comprises condensing dibenzanthrones with polynuclear aromatic compounds. A continuation in part of co-pending application Ser. No. 267,478, filed April 4, 1928.) Max Albert Kunz, of Mannheim, and Karl Koeberle, of Ludwigshafen-on-the-Rhine, Ger., assignors to General Aniline Wks., Inc., of N. Y., N. Y., No. 1,909,690, May 16, 1933.

1933 Fall Hosiery Colors

New renditions of taupe, representing the smart Fall evolution of Spring greys, grège and natural beige, are highlighted in the collection of twelve hosiery colors for Fall just released by the Textile Color Card Association to its members.

These subtle taupe tones of medium and darker value are emphasized as the outstanding neutral theme in Fall hosiery. They blend perfectly with the high-style taupes of both brownish and greyish casts, so significant in Fall costumes and accessories, and likewise key smartly with other fashionable autumnal shades, including darker greys, ruby, berry and vintage reds, navy and purplish blues.

The twelve new hosiery colors are classified on the card in three basic merchandising groups, as follows: Taupe Shades, Beige Shades, Brown Shades. In the taupe family, described above, are Beige Taupe, Biscayne, Smokebrown and Brown Taupe, the latter being identical with the important high-style costume and shoe shade of the same name.

Medium and darker beige tones in subdued neutral types, as well as clear warm versions, are presented for early Fall wear with a wide range of lighter costume shades, such as the new light browns, including tobacco and cocoa versions, the lighter mossy greens, clear reds, and darker beiges. The beige group comprises Gala, Clearsan, Bali and Dustbeige. Gala, a clear golden tone and the lightest of the beiges, will be worn for evening with white and pastel tints in the "bonbon" gamme.

The brown hosiery tones, entirely new in feeling, represent another highly important trend. This classification includes Honeybrown, Spicebrown, Jungle and Friar Brown. For late Fall and Winter wear, they offer the correct complement to smart neutral browns of the chestnut and chocolate families.

Spicebrown, a lighter and more animated rendition, was especially created to harmonize with costumes in rich reddish browns, which are expected to enjoy much fashion prestige for Fall. In their lighter and warmer interpretations, the brown hosiery shades will also supply the preferred contrasting note with rusts and greens, particularly the more vibrant metallic versions.

The new hosiery tones have been issued in the same practical form as the 1933 Spring hosiery shades, that is, in a "two-in-one" card, with generous size tabs for a permanent color record and large loose-leaf swatches for dyeing purposes. To further assist its members in the successful promotion of the hosiery shades, the Association is shortly issuing a Color Coordination Guide, briefly describing each tone and indicating its correct relation to the latest color trends in costumes, millinery and shoes.

Cyanamid Golf Outing

The Spring Golf Outing of the American Cyanamid Company and its subsidiary companies was held on June 3rd at the Timber Point Club, Great River, Long Island. Competition was keen for the Cups and Trophy prizes for Low Putts and Kicker's Handicap. The President's Cup for Teams of four, was won by the Klipstein Team with a net score of 332. The Calco Trophy was won by Mr. Philip Graham, of Boston, Mass., with a low gross score of 83. The runner up in this event was Mr. Paul Haddock, of Charlotte, N. C., with a gross score of 84. The Golf Committee Cup was won by Mr. Travis Melnick with a net score of 74. The runners up in this event were Messrs. Philip Graham and Arthur Campbell. The Low Putts Trophy was won by Mr. C. R. Matheny, of Linden, N. J. Kicker's Handicap prizes were won by Messrs. E. H. Driver, of New York; Travis Melnick, of New York, and J. N. Loomis, of Bound Brook, N. J. The baseball game in the afternoon, between the Sales Division and Accounting Division of the American Cyanamid Company, was won by the Accounting Division with a score of 16 to 15. A dinner was served in the spacious Club House in the evening.

Sulfogene Brown CL4R

Sulfogene Brown CL4R, a sulfur color which produces reddish brown shades of excellent fastness, has just been announced by the Dyestuffs Division of E. I. du Pont de Nemours & Company. It is described as being equal in strength to Sulfogene Bordeaux CF but very much bluer and noticeably duller. Although apparently similar to the sulfur bordeaux on account of its shade, it is distinctly not a dyestuff of this type.

Sulfogene Brown CL4R is said to be very fast to acids, ammonia, light, washing and water and is also satisfactory for acetic acid cross-dyeing. It may be dyed on yarn or piece goods, and does not change shade a great deal through aftertreatments.

Fast Indigosol Grey

After an extensive research the Carbic Color & Chemical Co. has succeeded in developing a Fast Indigosol Grey which fills a long felt deficiency in the Indigosol range. Hitherto, the production of Grey shades with Indigosols was confined either to Indigosol Printing Black IB, the fastness of which, particularly in light shades, was not satisfactory or a combination of three of the faster Indigosols.

Indigosol Grey IBL is a straight color said to be of outstanding fastness and is applied on the various fibres by the same methods as used for the other Indigosols. It yields a bluish shade of Grey which can be easily turned to neutral Grey by an addition of Indigosol Golden Yellow IRK.

Riches To Supervise Sales

The American Agricultural Chemical Company has appointed George E. Riches manager of the Chemical and wholesale department to supervise sales of heavy chemicals and insecticides.

Mr. Riches has a wide background of experience as a sales executive in the heavy chemical and insecticide field. He received his manufacturing training under his father, George R. Riches, founder of the old Riches Piver Company and inventor of commercial calcium arsenate and the first manufacturer of this product.

Mr. Riches is a graduate of Stevens Institute, where he majored in chemical engineering. In recent years he made a special study of the problems of silk dyeing and is considered an authority on silk weighting.

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The rate for "Position Wanted" advertisements in this column is 2 cents a word—with a minimum of 50 cents per insertion. For all other types of advertisements—i.e., help wanted, machinery or supplies for sale—the rate is $5.00 per column inch or less per insertion.

Position wanted: Secretary to textile consultant desires connection in the textile industry in New York City. Several years of experience in textile publishing and textile research laboratory fields. Thoroughly familiar with general textile terms. Address Box No. 783, American Dyestuff Reporter, 440 Fourth Ave., New York, N. Y.